Measurement and Factor Structure of Developmental Trauma Disorder Symptoms in Children Involved in Child Welfare

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Childhood trauma is associated with a wide array of neurodevelopmental, physiological, psychosocial, and emotional challenges beyond those captured by posttraumatic stress disorder (PTSD)—especially in instances of multiple and/or repeated traumas and traumas that occur in the context of a caregiving relationship. As a result, children who have experienced complex developmental trauma often receive multiple diagnoses concurrently and across their lifespan. Indeed, childhood trauma has been identified as a central transdiagnostic risk factor in the etiology of numerous mental disorders and in research examining the existence of a general psychopathology factor (p-factor) (Caspi et al., 2014). However, recent criticisms of p-factor modelling have questioned the interpretation and cross-study comparability of work in this area, calling for a more theory-driven approach to defining the general factor. Emotion dysregulation has been identified as a potential mediator in the relationship between childhood trauma and the transdiagnostic risk of psychopathology, and some researchers interpret the general factor as emotion dysregulation. However, researchers have yet to test emotion dysregulation as a reference domain for the p-factor or the structure of psychopathology within a Developmental Trauma Disorder (DTD) framework. This study attempted to address these gaps in a sample of (N = 555) children involved in the Ontario child welfare system who have experienced maltreatment. In the first part of the study, I assessed the degree to which the Assessment Checklist for Children (ACC) captures the proposed DTD diagnostic criteria. In the second part, I tested the factorial structure of DTD symptoms using Confirmatory Factor Analysis, including a single factor, correlated factors, second-order, fully symmetrical bifactor, and bifactor(s-1) model with emotion dysregulation as the general factor reference domain. The results identify gaps in the ACC when applied to the DTD framework. Further, the results suggest that the

bifactor(s-1) model fits the data best and provides the most interpretable results with meaningful clinical practice and research implications.

Keywords: Developmental Trauma Disorder, Emotion Dysregulation, Child Welfare, General Factor of Psychopathology, P-Factor, Confirmatory Factor Analysis, Longitudinal Measurement Invariance.

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This thesis was completed on the traditional territory of the Haudenosaunee, Anishinaabe, and Neutral Peoples and all data were collected on the traditional and treaty territory of the Michi Saagiig (Mississauga) and Chippewa Nations. I have lived in the valley of the Ose'kowáhne ("Grand River") for most of my life and I am grateful for the benefits that has afforded me, a white settler on stolen First Nation land, for nearly 30 years and for which it has afforded my family since my ancestors settled in the territory in 1806. While this thesis, unlike my previous theses, does not directly focus on addressing the legacy of colonialism, there are threads that tie the works together. Behaviours, emotions, and relationship are like fractals, mirrored in nested systems, from individuals, to families, to societies, and across time. "As above, so below," the old axiom goes. Thus, as colonial trauma and imperialism continue at national and international levels, so too does trauma pervade systems at smaller scales, within communities, within families, and between and within individuals. To address and interrupt the continuing cycle of trauma across interdependent systems, truth and understanding need to be gleaned, reparations need to be made, and rights need to be respected at multiple levels of analysis—including Indigenous Peoples' territorial and land rights. Upholding these rights is a responsibility we all must bear.

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Dedication

For the children and youth whose experiences, pain, strengths, and resilience can never be adequately represented by the numbers below.

&

For the caregivers, practitioners, and researchers who tirelessly strive to prevent and heal the wounds inflicted on so many.

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Introduction

Childhood maltreatment (i.e., abuse and neglect) is a global public health crisis, with international estimates indicating that more than 1 billion children per year are victims of interpersonal violence (Hillis et al., 2016). While rates of victimization tend to be higher in low-income countries, the problem remains substantial in high-income countries such as Canada (Hillis et al., 2016). For example, according to the Canadian General Social Survey on Victimization (2014), 33% of Canadians over 15 years of age reported experiences of physical or sexual abuse or witnessing violence among caregivers during childhood. Further, a recent study by Stewart and colleagues (2020) of 8980 children and youth from 50 mental health facilities across Ontario found that 46% had a history of maltreatment, and 29% experienced multiple types of interpersonal trauma. Other epidemiological studies have found higher rates, with upwards of approximately 50% of children and adolescents experiencing multiple types of victimization, suggesting that polyvictimization is the rule rather than the exception (Finkelhor et al., 2015; Finkelhor et al., 2011). Notably, approximately 90% of maltreatment occurs in the context of relationships with primary caregivers (Valentino, 2017). This situation is particularly dire: it creates a dilemma for children—as they often depend on these same caregivers for support—and often yields more complex clinical presentations.

The complex nature of developmental trauma often results in children and adolescents receiving multiple comorbid diagnoses, which often fail to account for the full breadth of their symptom profiles (D'Andrea et al., 2012; Herman, 1992a, 1992b; Cook et al., 2005). One of the

reasons for this gap is that, despite multiple iterations and revisions since their first editions, the current psychiatric nosologies remain ill-equipped to account for such complex presentations. In addition, issues persist in effectively classifying individuals who present with complex psychosocial and behavioural challenges due to the expression of symptoms that comprise putatively distinct disorders. Consequently, parallel efforts to refine diagnostic categories and to better understand the nature of psychopathology have continued since the first edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-I; American Psychiatric Association [APA], 1952) and the sixth edition of the International Classification of Diseases (ICD-6; World Health Organization, 1948). On the one hand, the quest to increase the utility of diagnostic categories based on research progress and clinical consensus has led to new psychological disorders and classifications (Blashfield et al., 2014). On the other, researchers have begun examining potential biological, structural, and etiological explanations to the problem of comorbidity and have proposed alternative ways to classify mental disorders, such as using functional dimensional (Hayes et al., 1996) and mechanistic (Cuthbert, 2014) approaches.

A working group of childhood trauma experts (van der Kolk et al., 2009) submitted a proposal in 2009 for the inclusion of a new diagnostic category, Developmental Trauma Disorder (DTD), to be included in the 5th edition of the DSM (DSM-5). However, the American Psychiatric Association's (APA) DSM trauma committee ultimately rejected the proposal, citing insufficient evidence as the basis for the decision. The DTD framework—a disorder of dysregulation that extends beyond the classic posttraumatic stress disorder (PTSD) symptoms—is viewed to encapsulate the diverse neurodevelopmental, psychological, emotional, behavioural, and relational outcomes associated with early interpersonal and attachment trauma and as being critical for the conceptualization of childhood trauma-related symptomatology. The present study

aims to contribute to the ongoing research on the construct validity of the DTD framework by examining the measurement and structure of DTD symptoms in children involved in the Ontario child welfare system with substantiated cases of maltreatment. Specifically, I test the applicability of the DTD criteria as an interpretive framework to enhance the understanding of the structure of children's psychosocial symptoms following significant interpersonal trauma and attachment disruption.

Complex Developmental Trauma

The term complex developmental trauma describes both children's exposure to multiple traumatic events and the immediate and long-term effects of this exposure (Cook et al., 2003). In terms of exposure, complex developmental trauma has been defined as the "…experience of multiple, chronic and prolonged, developmentally adverse traumatic experiences, most often of an interpersonal nature (e.g., sexual or physical abuse, war, community violence) and with early-life onset" (van der Kolk, 2005, p. 402). Complex developmental trauma tends to yield a wide range of detrimental immediate and long-term neurodevelopmental and psychosocial impairments, especially when the exposures occur during critical and sensitive periods of neurodevelopment[1] (Nelson et al., 2019; Nelson & Gabard-Durnam, 2020). Such experiences

[1] *Critical periods* are those during which irreversible changes in brain function occur and which lead to permanent functional effects while *sensitive periods* describe less strict periods of development in which experience disproportionately effects the brain, though redirecting development along a typical trajectory may be possible with effort and intensive intervention (Nelson et al., 2019). Notably, there is no single critical or sensitive period. Rather, studies have identified that certain brain areas have temporally unique critical/sensitive periods through development and are differently affected by the type of adversity experienced (e.g., neglect versus physical abuse versus sexual abuse, etc.; Herzog & Schmahl, 2018). Critical and sensitive periods have been found to cluster in the first few years of life (Nelson & Gabard-Durnam, 2020), which is not surprising given that infancy and early childhood are characterized by rapid brain growth and development, with brain synapses increasing by 500% by age 2 (Harden et al., 2019). However, studies have identified critical/sensitive periods through middle and late childhood (e.g., Anderson et al., 2008) and adolescence (e.g., Larsen & Luna, 2018).

initiate a negative developmental cascade that affects biological, psychological, emotional, and social processes over time (Christian & Joffe, 2014; Cicchetti & Toth, 2016; D'Andrea et al., 2012; Harden et al., 2019; Perry, 2009; Sheridan & McLaughlin, 2020; Toth & Manly, 2018). Complex developmental trauma differs from Type I trauma in terms of exposure and sequelae, which refers to an acute and single, unanticipated event (Terr, 1991) typically resulting in the symptoms characteristic of simple PTSD (Herman, 1992a).

Retrospective studies have estimated that the combination of interpersonal victimization and disrupted primary caregiving can explain 45% of the risk for childhood-onset psychopathologies such as anxiety, depression, dysregulation disorders, personality disorders, post-traumatic stress disorder (PTSD), psychosis, substance use disorders, and suicidality (Green et al., 2010; Norman et al., 2012; Teicher & Samson, 2013). Some have even suggested that individuals with psychopathology and who have a history of childhood maltreatment comprise a clinically and neurobiologically distinct subgroup. Teicher and Samson (2013) argue that individuals in this subgroup have earlier onset, greater symptom severity, more comorbidity, more consistent reductions in hippocampal volume and amygdala hyperreactivity, a greater risk for suicide, and poorer treatment outcomes.

While not the first to articulate the insufficiency of PTSD, Herman (1992b) introduced *complex trauma* or *complex PTSD* to the psychiatric lexicon. In discussing complex trauma occurring in childhood, Herman (1992b) articulates that the environment of childhood abuse fosters abnormal states of consciousness that violate "ordinary relations of body and mind, reality and imagination, knowledge and memory" and that "permit the elaboration of a prodigious array" of somatic and psychological symptoms (p. 122). Herman (1992a) illustrates the pervasive effects of complex developmental trauma on children's biological, cognitive,

behavioural, affective regulatory systems as well as distortions of personality development characterized by disorganized attachments, boundary violations, conflict, and potential for exploitation. Herman also describes deformations of identity, marked by a "malignant sense of the self," fragmentation, and dissociation and indicates that children with histories of complex trauma are at increased risk of repetition of harm, which can take the form of self-harm, further victimization, and assuming the role of a perpetrator (Herman, 1992a).

Since Herman's work, several studies have reviewed the scope of complex developmental trauma symptoms. An extensive white paper by Cook et al. (2003) and other members of the National Child Trauma Stress Network led to two seminal articles by van der Kolk (2005) and Cook et al. (2005). In these papers, the authors reviewed literature linking complex developmental trauma to several domains of impairment, including attachment disruption, biological and somatic dysregulation, affect regulation, dissociation, issues with behavioural and impulse control, cognitive and attentional impairments, and compromised self-concept. In 2012, D'Andrea and colleagues built off these conceptualizations in a substantial, updated review of the literature. The authors identified symptoms related to affect and behavioural dysregulation, disturbances of attention and consciousness, distortions in attributions, and interpersonal difficulties. In addition, many of the studies reviewed by D'Andrea and colleagues indicated that the expression of symptoms and biopsychosocial impairments tended to occur when children and youth had multiple experiences of interpersonal trauma and should therefore be considered as interrelated symptoms rather than independent, as per the dictates of the current nosology.

Emotion Processing as a Mediator of the Transdiagnostic Risk for Psychopathology Conferred by Complex Developmental Trauma

Childhood adverse experiences and cumulative stressors can have profound neurodevelopmental impacts that endure across the lifespan (Anda et al., 2006; Perry et al., 2018; Sheridan & McLaughlin, 2020). These impacts are especially pronounced when they occur during sensitive and critical periods of brain development (Nelson et al., 2019). Moreover, childhood trauma and early adversity are also related to a general risk factor for the development of psychopathology (Caspi et al., 2014; Wade et al., 2018, 2019) and Caspi et al. (2014) state that "…it is more difficult to identify a disorder to which childhood maltreatment is not linked than to identify a disorder to which it is linked with specificity" (p. 134). Accordingly, McLaughlin et al. (2020) describe a transdiagnostic model of the developmental mechanisms that explain the links between developmental trauma and psychopathology, which includes changes to emotion processing (i.e., elevated emotional reactivity, low emotional awareness, and difficulties with emotional learning and emotion regulation) as one of the fundamental mechanisms.

Given the critical role of caregiver-child interactions in co-regulation in infancy and the development of self-regulatory capacities through childhood and into adulthood, emotion regulation is an important mechanism to consider when examining the etiology of psychopathology in children who have experienced developmental trauma. The field of interpersonal neurobiology has made significant progress in articulating the developmental processes contingent on the parent-child attachment relationship. In the context of secure attachment relationships, the regulatory process of affect synchrony triggers "…homeostatic alterations of neuropeptides (oxytocin, endorphins, corticotropin-releasing factor, growth factors, etc.), neuromodulators (catecholamines), and neurosteroids (cortisol) that are critical to the establishment of social bonds and brain development" (Shore, 2013, p. 5-6). Importantly, these

processes serve to support the co-creation of positive arousal as well as the regulation of negative arousal, allowing for the gradual emergence of efficient self-regulation over time (Schore, 2013). Schore (2013) asserts that in the context of sensitive and responsive caregiver-child relationships, attachment histories become imprinted into right hemispheric cortical-subcortical circuits in implicit procedural memory, encoding strategies of affect regulation that implicitly guide the individual through interpersonal contexts. Further, these strategies of affect regulation are central to the processes of self-regulation, which include (1) interactive regulation (i.e., the ability to regulate psychobiological states of emotions in interpersonal contexts) and (2) autoregulation (i.e., the ability to regulate psychobiological states of emotions in autonomous contexts) (Schore, 2013). However, in the context of developmental trauma, the expected conditions for secure attachment and effective co-regulation are violated, thereby leaving the child to endure highly stressful and intense negative states for extended durations (Schore, 2013).

Perry (2009) articulates that high stress and deprivation in early childhood negatively alter the brain's sequential development. Specifically, because of the hierarchical process of brain development, the patterns of neural activity in lower brain systems (e.g., the brainstem and diencephalon) play a critical role in determining the overall organization and functioning of the brain, with implications for the development of self-regulatory systems, including affect regulation. Perry indicates that if the neural activity is "…regulated, synchronous, patterned, and of normal intensity," the brain areas higher in the hierarchy will organize in adaptive ways; however, if the activity is "…extreme, dysregulated, and asynchronous," the organization of the higher areas will reflect these abnormal patterns (Perry, 2009, p. 242). One of the outcomes of the overactivation of the threat systems in the brain due to trauma is overactivation (increased sensitization) of the limbic system, which is responsible, in part, for threat detection and

response, as well as deficits in prefrontal regions and neural networks involved in mediating the stress response (Perry et al., 2018).

Consequently, children who experience developmental trauma are more likely to develop higher stress sensitivity/emotional lability and poorer emotion regulatory capacities, which increases the risk for psychopathology. A longitudinal study using latent difference score models by Kim-Spoon et al. (2013) illustrates this process, whereby they examined how emotion regulation and emotion lability-negativity relate to internalizing symptomatology in 322 children from age 7 to 10 years (171 maltreated and 151 non-maltreated children). They found that emotion regulation mediated the relationship between emotion lability-negativity and internalizing symptomatology and that children with experiences of early maltreatment had higher levels of emotion lability-negativity at age seven, which contributed to poor emotion regulation at age eight, which predicted later internalizing symptoms. Another multi-cohort study, which included one cross-sectional sample of 167 adolescents aged 13 to 17 with physical, sexual, or emotional abuse exposure and one sample of 439 adolescents (*M age at T1* = 13.51; *SD* = .43) in a community cohort study followed over 5 years by Heleniak et al. (2016) found convergent evidence of the role of emotion regulation deficits as a transdiagnostic developmental pathway linking childhood maltreatment to psychopathology. The study found emotion regulation deficits to mediate the relationship between childhood maltreatment and internalizing disorders, higher emotional reactivity, and habitual engagement in rumination and impulsive responses to distress in both samples.

Neurobiological investigations focused specifically on emotion regulation have attributed the transdiagnostic nature of emotion dysregulation to weak executive control over subcortical brain functions (Beauchaine, 2015; Beauchaine & Cicchetti, 2019; Beauchaine & Zisner, 2017).

Typically developing children exposed to emotion-eliciting events display stronger subcortical responses than adults, though their frontal responses tend to be weaker and more diffuse (Beauchaine & Cicchetti, 2019; Macdonald et al., 2016). Normal pre-frontal cortex (PFC) neuro-maturation results in the top-down regulation of strong subcortical responses becoming more effective (e.g., Arnsten & Rubia, 2012); however, research has shown that, across disorders, the neurodevelopment of the PFC and the connections between cortical and sub-cortical regions become compromised (Beuchaine & Cicchetti, 2019). Further, the development of both internalizing and externalizing disorders across development is due, in part, to failures in neuromaturation of prefrontal regions responsible for executive function, self-regulation, and emotion regulation (Beauchaine et al., 2019; Beauchaine & Cicchetti, 2019).

Developmental Trauma Disorder – Proposal for a Unifying Diagnosis

Given the complexity of sequelae described above, individuals with histories of complex developmental trauma are often diagnosed with multiple comorbid disorders, which are viewed as discrete problems to be addressed rather than as facets of one larger problem (Herman, 1992a; D'Andrea et al., 2012; Ford et al., 2011; Kretschmar et al., 2017). Such multi-diagnostic formulations pose challenges for children, caregivers, and clinicians when it comes to understanding children's difficulties in the context of their trauma histories, as well as being harder to treat (Nanni et al., 2012; Shenk et al., 2014). This is particularly evident in children involved in child welfare as they tend to represent those children at the extreme end of the distribution of children who have been abused and neglected (Fisher, 2015; Pace et al., 2019; Tarren-Sweeney, 2008).

One of the ways researchers and clinicians have proposed to address the transdiagnostic risk for psychopathology conferred by complex developmental trauma is to adopt a new

diagnostic category. In recognition of complex trauma's unique neurobiological and phenotypic signature, the National Child Traumatic Stress Network convened an expert task force of 12 child trauma experts who developed proposed criteria for a new disorder, *Developmental Trauma Disorder (DTD)*. Based on an extensive empirical literature review, expert clinical wisdom, an international survey of child-serving clinicians (Ford et al., 2013), and preliminary analysis of data from thousands of children in numerous clinical and child service system settings (van der Kolk, 2014, p. 488-489), the task force (van der Kolk et al., 2009) submitted a proposal for the American Psychiatric Association (APA) in 2009 to adopt DTD as a unifying diagnosis to capture the breadth of symptoms found in children who have experienced multiple or prolonged traumatic events involving interpersonal violence and impaired caregiving. DTD was established as a framework to support assessment and treatment planning to address the unique and wide-ranging complex trauma sequelae and to facilitate improvements in clinical outcomes (Ford et al., 2013).

The original proposed diagnostic criteria expanded the nature of trauma exposure (criterion A) and included three domains of dysregulation (emotional and somatic dysregulation; attentional and behavioural dysregulation; and self and relational dysregulation) as well as some of the same features of the criteria for PTSD (e.g., intrusive symptoms, avoidance of threat stimuli, and negative alterations in cognitions and mood; van der Kolk et al., 2009). Since the initial proposal, the criteria have been refined. The most recent version of the DTD criteria (Ford et al., 2019) include the following:

Criterion A: Lifetime contemporaneous exposure to developmental trauma. The proposed criterion A for DTD uniquely requires the lifetime contemporaneous exposure to both *primary caregiver attachment disruption* (sub-criterion A1) and *interpersonal victimization* (sub-

criterion A2). In this context, criterion A1 and A2 are operationalized as "impaired caregiver, neglect, prolonged separation, and verbal or emotional abuse" and "physical or sexual abuse or assault, domestic/intimate partner violence," respectively (Ford et al., 2019).

Criterion B: Affective and somatic dysregulation. The first domain of dysregulation within the DTD framework relates to developmental impairments in children's ability to recognize and regulate emotional states and physical sensations. The sub-criteria include *emotion dysregulation* (sub-criterion B1), characterized by extreme, or impaired recovery from negative affect states, *somatic dysregulation* (sub-criterion B2), characterized by aversion to touch, sounds, or somatic distress that cannot be medically explained or resolved, *impaired awareness or dissociation of emotions or body* (sub-criterion B3), characterized by an absence of emotion or physical anesthesia that cannot be medically explained or resolved, and *impaired capacity to describe emotions or bodily states* (sub-criterion B4), characterized by alexithymia or an impaired ability to recognize or express somatic feelings or states (Ford et al., 2019).

Criterion C: Attentional and behavioural dysregulation. Criterion C includes various symptoms related to the neuro-developmental effects of complex trauma, such as issues with attention and executive functioning, and maladaptive behavioural coping mechanisms, such as threat preoccupation or avoidance, self-harming behaviours, and maladaptive coping strategies. The specific sub-criteria include *attentional bias toward or away from potential threats* (sub-criterion C1), characterized by threat-related rumination or hyper- or hypo-vigilance to actual or perceived danger, *impaired capacity for self-protection* (sub-criterion C2) such as extreme risk-taking and recklessness or intentional provocation of conflict or violence, *maladaptive self-soothing* (sub-criterion C3), *habitual or reactive self-harm* (sub-criterion C4), and the *inability to initiate or sustain goal-directed behaviours* (sub-criterion C5) (Ford et al., 2019).

Criterion D: Self and relational dysregulation. Criterion D focuses on children's maladaptive internal working models (beliefs about self and others) and associated dysfunctional social behaviours. The specific criteria include *persistent extreme negative self-perception* (sub-criterion D1) such as self-loathing or viewing oneself as damaged or defective, *attachment insecurity and disorganization* (sub-criterion D2), characterized by parentified over-protection or difficulty tolerating reunion after separation, *extreme persistent distrust, defiance, or lack of reciprocity in close relationships* (sub-criterion D3), including an expectation of betrayal or oppositional-defiance based on an expectation of coercion or exploitation, *reactive verbal or physical aggression* (sub-criterion D4), *psychological boundary deficits* (sub-criterion D5) characterized by inappropriate physical or sexual contact or excessive reliance on peers or adults for safety and reassurance, and *impaired capacity to regulate empathic arousal* (sub-criterion D6), including lack of empathy for, or intolerance of, other's distress or excessive responsiveness to other's distress (Ford et al., 2019).

Despite the evidence and support from clinicians worldwide, the DSM subcommittee ultimately rejected the proposal for including DTD in the DSM-5. Some researchers have contested the validity of the DTD criteria, and the American Psychiatric Association cited a lack of evidence as the reason for their decision to exclude DTD from the DSM-5 (van der Kolk, 2014). Expressly, Matthew Friedman, executive director of the National Center for PTSD and chair of the relevant DSM subcommittee, indicated that the committee regarded DTD as not being required to fill a "diagnostic niche," that "[t]he notion that early childhood adverse experiences lead to substantial developmental disruptions is more clinical intuition than a research-based fact," and that such assertions are "commonly made but cannot be backed up by prospective studies" (van der Kolk, 2014, p. 226).

Despite the DSM subcommittee's conclusion to reject the diagnosis, researchers, clinicians, and people with lived experience have continued to advocate for the utility of the DTD framework and efforts to accrue evidence for DTD's construct validity have persisted. A multi-site epidemiological field trial by the National Child Traumatic Stress Network DTD expert committee is ongoing and has recently reported some of their findings. Spinazzola et al. (2018) found that while both DTD and PTSD were associated with a history of physical and emotional abuse, family violence, neglect, and polyvictimization, children who met the criteria for DTD were more likely to have grown up with an impaired caregiver and to have experienced community violence. The study also found that DTD rarely occurred without both interpersonal victimization and attachment disruption. The combination of these types of adversity was more related to the complex symptoms involved in DTD than to PTSD (Spinazzola et al., 2018).

Only one standardized measure currently exists to assess children's symptoms according to the DTD framework. The National Child Traumatic Stress Network DTD expert committee designed the Developmental Trauma Disorder Semi-Structured Interview (DTD-SI) to conduct the field trial. A recent construct validity study based on these data found the measure to have good construct validity, including reliability, and convergent and divergent validity. These aspects of construct validity were examined through comparisons with data related to trauma exposure and attachment disruption history (assessed by the Traumatic Events Screening Instrument; TESI), DSM-IV disorders (assessed using the Kiddie Schedule for Affective Disorders and Schizophrenia, Present/Lifetime Version; K-SADS-PL), potential alternative DSM-5 disorders (based parent responses to symptom checklists), parent rating on the Child Behavior Checklist (CBCL) and Child Emotion Regulation Checklist (CERC), and child self-reported emotion dysregulation (Emotion Regulation Questionnaire), self-efficacy and optimism

(Children's Hope Scale), and quality of life (Pediatric Quality of Life Enjoyment and Satisfaction Questionnaire). Multivariate and bivariate analyses looking at the discriminant validity from PTSD indicated that the psychiatric comorbidities unique to DTD (ADHD, separation anxiety disorder, oppositional defiant disorder, conduct disorder, and panic disorder) whereas PTSD was uniquely comorbid with two internalizing disorders (generalized anxiety disorder and major depressive disorder) (van der Kolk et al., 2019). These results demonstrate that DTD may help to identify poly-traumatized children who might be missed if PTSD is the only framework used to assess trauma sequelae (van der Kolk et al., 2019).

Some studies have also looked at the applicability of the DTD framework to diverse and cross-cultural contexts. For example, Klasen et al. (2013) examined the symptoms of 330 Ugandan former child soldiers and found that 78.2% met the criteria for DTD, while only 33% met the criteria for PTSD. What is more, only 1% met criteria for PTSD alone, suggesting that DTD was a more accurate framework than PTSD for describing these children's symptom constellations. Additionally, a small study by Foster et al. (2019) examined the DTD framework in a sample of 48 Hispanic and African American youth in the Bronx, New York, who had been polyvictimized. The authors found the prevalence of DTD symptomatology (n = 25; 47%) to be comparable to that of both DSM-IV PTSD (n = 9; 19%) and DSM-5 PTSD (n = 16; 30%) symptomatology. Further, the results indicated that youth who met DTD criteria did not necessarily meet PTSD diagnostic thresholds. Without the application of the DTD diagnostic framework, the youth met criteria for an average of three Axis I disorders, with PTSD being the fifth most prevalent diagnosis.

The Need for Developmental Trauma Disorder Specific Measures

The recent research on the validity of the DTD framework is promising, illustrating the

utility of using the provisional diagnostic criteria to capture children's symptoms that extend beyond those of simple PTSD. However, apart from the DTD field trial, the studies have assessed the DTD criteria by selecting items on an ad hoc basis from other broadband measures of child and adolescent mental health problems. Further, the psychometric properties of the DTD measures that they constructed were not reported, leaving doubts surrounding the validity of the DTD assessment.

Recognizing the need for measures that capture complex developmental trauma symptomatology, Denton and colleagues (2017) reviewed 29 trauma measures developed or evaluated since 2004 to identify those that are developmentally appropriate and potentially applicable for the assessment of developmental trauma symptoms in children and adolescents. The authors distinguished between measures validated for children (0 to 12 years) and adolescents (12 – 18 years) and concluded that the Assessment Checklist for Children (ACC; Tarren-Sweeney, 2007) and the Assessment Checklist for Adolescents (ACA; Tarren-Sweeney, 2013a) as well as their associated brief versions (Tarren-Sweeney, 2013b), are the most promising measures for assessing developmental trauma symptomatology. The authors recommended these measures as they take a developmental and attachment focus. Additionally, given that Tarren-Sweeney developed them to assess the range of symptoms seen in children in out-of-home care, they capture the breadth of complex developmental trauma presentations (Denton et al., 2017).

Complex Developmental Trauma, Co-morbidity, and the General Psychopathology Factor

The poor prognosis of complex developmental trauma (D'Andrea et al., 2012; Schmid et al., 2013) may, in part, be attributed to the scope of processes that are affected, including transdiagnostic mechanisms such as emotion processing. This poses difficulties within the

limitations of current diagnostic systems. Indeed, researchers and clinicians have long been aware that psychiatric nosologies are not designed for individuals who have experienced complex trauma (Herman, 1992a). However, beyond the lack of fit, complex developmental trauma leads to such diagnostic complexity due to the conceptualization of mental disorders as putatively distinct categories comprised of specific symptom profiles. The DSM and ICD characterize mental disorders as largely separate diagnostic entities. However, there is a high degree of overlap in symptoms across diagnostic categories. This is problematic, with concurrent comorbidity rates generally adhering to the rule of 50% (i.e., 50% of people who meet diagnostic criteria for one disorder also meet diagnostic criteria for a second, and 50% for people who meet diagnostic criteria for two disorders meet the criteria for a third, and so on; Caspi et al., 2014; Newman et al., 1998) and heterotypic/sequential comorbidity rates being even higher (Caspi & Moffitt, 2018; Copeland et al., 2011). The comorbidity among mental disorders illustrates the limitations of the categorical classification of psychiatric symptom profiles. It obfuscates the underlying mechanisms shared by various disorders, which are key intervention targets. This may limit clinical decision-making as well as the potential utility of disorder-specific research.

The high degree of comorbidity led to calls in the mid-1990s for research that would examine patterns of comorbidity to "elucidate the broad, higher-order structure of phenotypic psychopathology" (Clark et al., 1995, p. 131; cited by Caspi et al., 2014, p. 120). Such hypotheses about the relationships among symptoms and disorders, including the existence of latent factors of psychopathology, were hoped to causally explain why some individuals develop putatively distinct disorders (Caspi et al., 2014). Further, these calls built on previous work in children's mental health measurement, such as that by Achenbach and Edelbrock (1981). In the development of the Child Behaviour Checklist (CBCL), Achenbach found that childhood

psychopathology symptoms converged on two syndromes: internalizing (overcontrolled) and externalizing (undercontrolled). Disorders belonging to the internalizing factor include symptoms that are manifest internally, such as anxiety and depression. In contrast, externalizing disorders are those that are expressed outwardly, such as substance use, conduct issues, and hyperactive-impulsive symptoms. Thus, the internalizing-externalizing framework provides a valuable innovation in understanding the common links between certain mental disorders and continues to predominate. However, some researchers have pointed out that this two-factor solution leaves out an entire cluster of disorders: namely, thought disorders, which include bipolar disorder, schizophrenia, and obsessive-compulsive disorder (Caspi et al., 2014). Additionally, while the specific factors can account for some of the co-occurrence of disorders, these domains are highly correlated, leaving the problem of cross-domain comorbidity unaddressed. Thus, spurred by factor analytic work by Lahey et al. (2012), interest in finding a general factor of psychopathology that would indicate a liability to all mental disorders/symptoms—and thereby explain the correlation between the specific internalizing and externalizing factors—has mounted over the last decade.

Lahey and colleagues (2012) were among the first to test for a general psychopathology factor. In a large sample of adults, Lahey et al. tested three models: (1) a correlated two-factor model, with 11 DSM-IV disorders loading on to internalizing and externalizing orientations; (2) a three-factor model with disorders loaded onto fears, distress, and externalizing factors; and (3) an uncorrelated bifactor model in which disorders were loaded onto the general psychopathology factor as well as one of the fears, distress, or externalizing factors (Lahey et al., 2012). This study found that the inclusion of a general psychopathology factor in the model with the fears, distress, and externalizing factors created the best fitting model and accounted for much of the variance in

the presence of DSM-IV disorders. Additionally, the general psychopathology factor at baseline prospectively predicted future psychopathology and functioning assessed at time 2, beyond the variance accounted for by the fears, distress, and externalizing factors (Lahey et al., 2012). Caspi and colleagues (2014) extended the work by Lahey et al. (2012), reproducing the models in a longitudinal sample from New Zealand that followed approximately 1000 individuals from age 18 to 38. Caspi and colleagues fit similar models to those fit by Lahey et al.: (1) a correlated three-factor model, with externalizing, internalizing, and thought disorders; (2) an orthogonal bifactor model, with mental disorders loaded onto a '*p*-factor' in addition to the internalizing, externalizing, and thought disorder factors; and (3) a unidimensional model with the disorders loaded only on the *p*-factor. Like Lahey et al.'s (2011) results, the bifactor model fit the best. However, the authors dropped the specific thought disorders factor due to obsessive-compulsive disorder (OCD), mania, and schizophrenia having non-significant factor loadings after including the *p*-factor in the model (Caspi et al., 2014).

Since Lahey et al.'s (2012) and Capsi et al.'s (2014) research, identifying a general psychopathology factor has become an area of intense interest as a possible means of explaining the phenomenology and etiology of psychopathology and comorbidity. The *p*-factor has been reproduced by numerous studies and has been found to account for much of the variance in symptoms/disorders in samples across the lifespan. And indeed, the *p*-factor research has been extended to child and youth samples and have found higher levels of the *p*-factor in childhood to uniquely predict severe mental health outcomes in adolescence, including diagnoses of anxiety and mood disorders, attention deficit/hyperactivity disorder (ADHD), self-harm and suicidal ideation, substance use disorders, psychoactive medication prescriptions, criminal convictions, and failure to complete high school in adolescence (e.g., Gomez et al., 2019; Haltigan et al.,

2018; Manfro et al., 2019; McElroy et al., 2018; Patalay et al., 2015; Pettersson et al., 2018; Sallis et al., 2019; Wade et al., 2018, 2019). However, despite the proliferation of *p*-factor research, there is little agreement about what the *p*-factor represents. Some suggest that the *p*-factor represents the liability for psychopathology due to non-specific genetic and environmental influences (Allegrini et al., 2020; Lahey et al., 2011, 2012, 2017; Selzam et al., 2018). Others conceptualize the *p*-factor as representing severity (Caspi et al., 2014, 2018), negative emotionality (Brandes et al., 2019; Caspi et al., 2014), poor constraint and impulsivity (Caspi et al., 2014; Castellanos-Ryan et al., 2016), low agreeableness and low conscientiousness (Caspi et al., 2014; Castellanos-Ryan et al., 2016), weak top-down emotion regulation (Beauchaine & Zisner, 2017; Carver et al., 2017), and global deficits in executive functioning (Martel et al., 2017; White et al., 2017; Bloemen et al., 2018; Wade et al., 2019). Additionally, a general dysregulation profile (DP) factor representing emotional, cognitive, and behavioural dysregulation has been found to be an appropriate proxy for the *p*-factor (Haltigan et al., 2018).

While some research has examined the association between childhood maltreatment and the general factor of psychopathology, there have been relatively few studies to examine the structure of psychopathology within clinical samples of children with developmental trauma exposure. With that said, the studies that have done so have provided support for the mediating role of emotion regulation in the relationship between early childhood maltreatment and the transdiagnostic risk for psychopathology. For example, Wade et al. (2018) demonstrated that children with histories of early adversity, particularly those with experiences of severe early deprivation, have an increased transdiagnostic risk for psychopathology in a longitudinal, randomized clinical trial involving 220 children from Bucharest, Romania. One-hundred nineteen children residing in six institutions were randomly assigned to care as usual ($N = 58$) or

foster care ($N = 61$) and compared to a matched sample of never-institutionalized children ($N = 101$). Children in the care as usual and foster care groups had higher levels of the *p*-factor than the never-institutionalized group at 8 eight years. By age 16 years, children in care-as-usual had stable levels of *p*-factor while children assigned to foster care showed modest declines.

In a sample of 262 children and adolescents, of which 162 had histories of abuse or exposure to domestic violence, Weissman et al. (2019) identified that weak top-down emotion regulation functions significantly mediated the effect of both childhood maltreatment exposure and maltreatment severity on *p*-factor scores after controlling for *p*-factor scores at baseline. Thus, emotion regulation, conceptualized as a set of interrelated psychological and neurobiological processes that are related to modulation of affect and the inhibition of prepotent responses, seems to be a key mediator in explaining why complex developmental trauma leads to the expression of such a wide range of psychological symptoms.

These conclusions have been supported more recently by Jenness et al. (2020), who tested the mediating effect of neural circuits underlying emotion regulation in the relationship between childhood maltreatment and psychopathology. The authors conducted whole-brain and region of interest analyses from functional magnetic resonance imaging (fMRI) scans with 151 youth aged eight to 16 years, 79 of whom had experiences of maltreatment. This study found an association between maltreatment and greater recruitment of amygdala and salience processing regions and reduced PFC when viewing negative versus neutral images. Further, they found that the reduced PFC recruitment mediated the relationship between maltreatment and *p*-factor scores in a bifactor measurement model. Maltreated youth also showed increasing PFC recruitment across the transition to adolescence during reappraisal, while non-maltreated youth showed decreasing age-related recruitment. The authors point out that this difference may reflect less

efficient emotion regulation among youth with a history of maltreatment. It is important to note that the *p*-factor research has recently come under scrutiny. Some suggest that the *p*-factor may be nothing more than a statistical farse that can be attributed to factors such as the positive manifold[2] (van Bork et al., 2017) and particular response styles (Caspi & Moffitt, 2018), though these have been discounted as untenable given the robust associations within structural equation models (Caspi & Moffitt, 2018; Fried et al., 2021; Hyland et al., 2018). Fried et al. (2021) has challenged the assumption that the *p*-factor (or any of the research examining latent factors of psychopathology) reflects liability, asserting that it instead represents the degree of impairment or dysfunction. For example, in a nationally representative U.S. sample of 43,000 individuals at two time-points, Fried et al. (2021) found that the general and specific factor scores are nearly identical to the summed scores of the disorders, suggesting that these latent constructs are not actually causal but are merely variables denoting severity and comorbidity. One of the criticisms they pose is that it is necessary to model the *p*-factor on data for risk factors and etiology rather than on data on symptoms and diagnoses to quantify liability (Fried et al., 2021). Eid et al. (2017) and Heinrich et al. (2020a, 2020b) posit that the fully symmetrical bifactor models (whereby each indicator loads on one uncorrelated specific factor and a general psychopathology factor) include several assumptions that have not been met in much of the previous research due to the presence of anomalous results, such as negative factor loadings and Heywood cases. Such

[2] The positive manifold means that all variables in a dataset are positively correlated with each other. Van Bork et al. (2017) and others (e.g., Carroll, 1993) argue that the positive manifold will always be present in data that can be explained by a general factor. However, the authors also posit that when the variance-covariance matrix features a positive manifold, it does not validate the existence of a common cause, even though a general factor may be found, as other explanations may account for the correlational structure, including the biological concept of mutualism. Mutualism, when applied to psychopathology, holds that symptoms are not caused by a latent common disease/disorder but rather can be seen to influence each other thereby leading to symptom profiles that may characterize disorders (van Bork et al., 2017).

results make the interpretation of the general factor difficult and have typically been dealt with by dropping specific factors. When this is done, argue Heinrich et al. (2020a, 2020b), the general factor becomes defined by the specific factor that was dropped rather than the unknown variables that influence the general liability to psychopathology. This bifactor(s-1) model (Eid et al., 2017) requires one to define the general factor that is causing the variance in the specific factors and should be done *a priori* and based on theoretical rationale rather than be a post hoc, data-driven approach to resolving issues with the symmetrical bifactor models. It is conceivable that the solution for a defined general factor proposed by Eid et al. (2017) and Heinrich et al. (2020a, 2020b) may also help to address the issue raised by Fried et al. (2021) in that, by defining the general factor, it no longer represents the sum of symptoms or diagnoses but rather delineates the variance accounted for in the specific factors by the reference domain that defines the *p*-factor.

The Present Study

Based on the review of the literature related to complex developmental trauma, the need for more research to explicitly test the proposed diagnostic framework's construct validity is obvious. Two gaps are evident. First, while Denton et al. (2017) concluded that the Assessment Checklist measures are the most appropriate for capturing developmental trauma sequelae, these measures have not been empirically tested against the proposed diagnostic entity. Thus, specific testing of the applicability of the Assessment Checklist measures to the DTD framework is still needed. Second, the critiques related to anomalous results within *p*-factor research, and the recommendation to test bifactor(s-1) models with a reference factor, provide an important new direction for research on the *p*-factor. Given that impairment of emotion regulation is both a negative consequence and an important mechanism connecting the experience of developmental trauma with subsequent difficulties, emotion dysregulation is a fitting candidate to be tested as a

p-factor reference domain.

The present study aimed to address these gaps in two parts. First, I sought to extend the findings by Denton et al. (2017) that the Assessment Checklist for Children is the most appropriate measure of developmental trauma symptoms by examining the existing scales of the ACC and assessing whether they accurately capture the proposed diagnostic criteria for DTD. I sought to answer the following questions: (1.1) are the ACC scales appropriate proxies for DTD symptomatology or is a reorganization of the items required for the measure to accurately relate to DTD diagnostic criteria, and (1.2) do the items of the ACC comprehensively capture the symptomatology included in the DTD diagnostic criteria? I predicted that the existing ACC scales would be appropriate proxies (question 1.1) and that they would capture the full extent of DTD symptomatology (question 1.2).

Second, I sought to explore the structure of psychopathology in a clinically complex sample of children who have experienced developmental trauma and who received therapeutic services through the Therapeutic Family Care Program (TFCP) in Cobourg, Ontario. Specifically, I sought to address the following questions: (2.1) can developmental trauma symptoms be explained by a single factor of psychopathology, (2.2) can developmental trauma symptoms be explained by three dimensions of psychopathology, (2.3) can developmental trauma symptoms be explained by a general factor of psychopathology (*p*-factor), beyond the specific dimensions, and (2.4) what happens to the specific factors after the effect of the general factor is extracted? Given the recent calls to define the general factor based on theoretical grounds (Eid et al., 2017; Heinrich et al., 2020a, 2020b; Fried, 2021) and that emotion dysregulation is a principal component of the proposed DTD diagnostic criteria, I hypothesized that all models would fit the data well but that the bifactor(s-1) model, with the *p*-factor defined

as emotion dysregulation, would be the best-fitting model (questions 2.1, 2.2, 2.3). I also hypothesized that the general factor would account for much of the variance in children's symptoms (question 2.4).

Method

Sample

The present study includes caregiver-reported assessments for 555 children who received therapeutic services through TFCP between the years 2000 and 2019. All children and youth have substantiated cases of maltreatment and were referred to TFCP by Children's Aid Societies in three Southern Ontario catchment areas (Durham, Kawartha-Haliburton, and Highland Shores). While involved with TFCP, families engaged in Dyadic Developmental Psychotherapy (DDP; Hughes et al., 2015), a caregiver-oriented, attachment-focused intervention designed to support families with children who have experienced developmental trauma. The agency aims to support children's healing from their traumatic experiences by fostering the development of secure caregiver-child relationships that are safe, accepting, and attuned to the child's needs and histories. Throughout their involvement with TFCP, children's caregivers complete assessments of their psychosocial functioning approximately every six months for TFCP's standard monitoring and quality assurance procedures.

Caregivers who reported on children's symptoms at first assessment, in order of frequency, included foster parents (n = 309, 55.68%), relatives other than birth/step/grandparents (n = 60, 10.81%), grandparents (n = 55, 9.91%), adoptive parents (n = 55, 9.91%), birth parents (n = 51, 9.19%), step-parents (n = 10, 1.80%), group home staff (n = 13, 2.34%), and other caregivers (n = 2, 0.36%). Consistent with these numbers, most children (n = 313, 56.40%) had their first assessment completed while in Foster Care. Other children lived in kinship care (n = 116, 20.90%), adoptive care (n = 55, 9.91%), with a birth parent (n = 52, 9.37%), in a group home (n = 13, 2.34%), or in another placement (n = 6, 1.08%). Thirty-nine children with follow-up assessments (11.96%) experienced a change in their placement and 42 (12.88%) were

assessed by different caregivers between the first and second assessments. The average age of the children at the time of their first assessment was 9.57 years (*SD* = 3.51) and 229 (41.26%) were female. Children were assessed between 1 and 11 times (*M* = 2.28, *SD* = 1.68) depending on the duration of their involvement with the program; however, the present study only includes data from the first two assessments (Time 1: *N* = *555*; Time 2: *N* = 326) due to model complexity (described below).

Procedure

All data were collected and maintained by TFCP clinical and administrative staff. Clinicians asked caregivers to complete a questionnaire to assess the psychosocial functioning of their child approximately every six months while receiving services at TFCP. TFCP shared their anonymized data for the purposes of examining the functioning of the children in their program and for the purposes of the present research. The University of Waterloo Research Ethics Committee (ORE #41024) reviewed and approved the use and analysis of TFCP's standard program monitoring data.

Measures

Assessment Checklist for Children (ACC). The ACC is a 120-item measure in which caregivers rate the "behaviors, emotional states, traits and manners of relating to others, as manifested by children in care and those adopted from care" (Tarren-Sweeney, 2013, p. 4) approximately every 6 months, with the first assessment occurring upon entry into TFCP services. Eighty-one items focus on "less critical/higher incidence" problems (e.g., "adjusts slowly to changes," "attention seeking behavior"), using a 3-point scale (0 = Not true, 1 = Partly true, 2 = Mostly true) and 39 items focus on "more critical/lower incidence" problems (e.g., "asks to be physically punished," "attempts suicide"), using a 3-point scale (0 = Did not occur, 1

= Occurred once, 2 = Occurred more than once). Exploratory factor analyses by Tarren-Sweeney (2007) yielded 10 clinical subscales, one 'other' subscale, and two low self-esteem subscales. Clinical subscales include (1) *sexual behaviour* (e.g., "Sexual behaviour not appropriate for his age," "Sexual relations with an adult"), (2) *pseudomature interpersonal behaviour* (e.g., "Precocious (talks or behaves like an adult)," "Treats you as though you were the child, and s/he was the parent"), (3) *nonreciprocal interpersonal behaviour* (e.g., "Avoids eye contact, except if in 'trouble,'" "Does not show affection"), (4) *indiscriminate interpersonal behaviour* (e.g., "Attention-seeking behavior," "Too friendly with strangers"), (5) *insecure interpersonal behaviour* (e.g., "Fears you will reject him," "Worries that something bad will happen to you"), (6) *anxious distrustful* (e.g., "Distrusts adults," "Is fearful of being harmed"), (7) abnormal pain response (e.g., "Does not cry," "Laughs if hurt"), (8) *food maintenance* (e.g., "Eats too much," "Hides or stores food"), (9) *self-injury* (e.g., "Asks to be physically punished," "Causes injury to her/himself"), (10) *suicidal discourse* (e.g., "Attempts suicide," "Describes how he would kill her/himself"). The *other* scale includes items such as "Can't concentrate, short attention span" and "Has an imaginary friend." Low self-esteem subscales include *negative self-image* (e.g., "Believes s/he is no good at anything," "Feels worthless or inferior") and *low confidence* (e.g., "Does not speak up for her/himself," "Gives up too easily"). The Total Clinical Score composite scale is composed of the 10 clinical subscales and the Other scale, while the Self-Esteem composite scale is composed of the two negative self-esteem subscales. The clinical scales have cut-off points to demarcate normal, elevated, and clinical ranges of behavioural (dys)functioning. It is worth noting that the original norm-referenced group were children between the ages of 4 and 11 years (Tarren-Sweeney, 2013); thus, it is unclear as to whether the clinical cut-offs are valid for children beyond the age range of the norm-referenced group. Nevertheless, this study

includes all children and youth who were assessed with the ACC, as many of the youth were initially assessed prior to the development of the adolescent-specific measure (i.e., the Assessment Checklist for Adolescents, ACA; Tarren-Sweeney, 2014). The ACC demonstrates good psychometric properties. Internal consistency estimates for the first assessment in the present sample are as follows: clinical subscales (α = .54 – .86), total clinical score (α = .92), self-esteem subscales (α = .76, .89), and composite self-esteem scale (α = .89). Cronbach's alpha coefficients and 95% confidence intervals for all scales are presented in Appendix A.

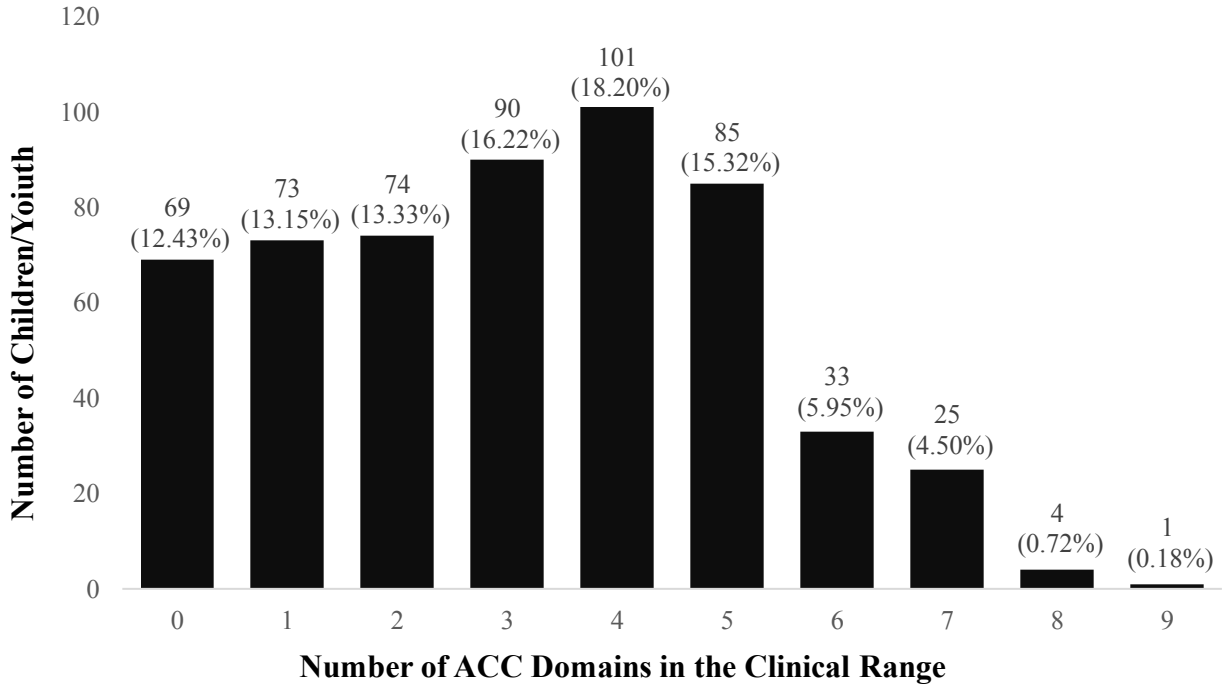
Table 1 presents the proportion of children who fell within the normal, borderline, and clinical range for each of the ACC clinical scales at their first assessment. Self-esteem scales were not included due to the lack of established thresholds for normal and clinically significant scores. The results indicate that most children (*n* = 434; 78.2%) had total clinical scores in the clinical range, signifying that most children in the sample presented to TFCP with significant levels of psychosocial dysfunction.

Table 1. Distribution of Children's Psychosocial Functioning at Baseline according to Clinical Cut-offs.

ACC Scale	Normal Range *n* (%)	Borderline Range *n* (%)	Clinical Range *n* (%)
Total Clinical Score	**78 (14.05%)**	**43 (7.75%)**	**434 (78.2%)**
Insecure Interpersonal Behaviour	123 (22.16%)	77 (13.87%)	355 (63.96%)
Non-Reciprocal Interpersonal Behaviour	147 (26.49%)	85 (15.32%)	323 (58.20%)
Pseudomature Interpersonal Behaviour	180 (32.43%)	105 (18.92%)	270 (48.65%)
Indiscriminate Interpersonal Behaviour	178 (32.07%)	130 (23.42%)	247 (44.50%)
Anxious-Distrustful	197 (35.50%)	116 (20.90%)	242 (43.60%)
Suicide Discourse	434 (78.20%)	N/A	121 (21.80%)
Sexual	337 (60.72%)	117 (21.08%)	101 (18.20%)
Self-Injury Total	378 (68.11%)	76 (13.69%)	101 (18.20%)
Food Maintenance	394 (70.99%)	96 (17.30%)	65 (11.71%)
Abnormal Pain Response	501 (90.27%)	28 (5.05%)	26 (4.68%)

In addition to the proportion of children who fall into the normal, borderline, and clinical ranges for each of the ACC scales, I also calculated the number of ACC scales in which children scored above the clinical cut-offs (see Figure 3). Most children (n = 486; 87.56%) scored within the clinical range for at least one of the ACC scales. On average, children scored in the clinical range for multiple ACC scales (M = 3.12; SD = 2.01).

Figure 1. Number of ACC Scales in the Clinical Range



Analysis

This study included two analytic phases. The first phase involved examining the extent to which the ACC scales and ACC items map onto the proposed DTD criteria. This involved completing an item-level content analysis using the DTD criteria to guide deductive coding. The second phase involved modelling the re-coded ACC items using confirmatory factor analysis (CFA) and testing for measurement invariance over repeated assessments.

Content Analysis. The first step of the present study included a content analysis of the items of the ACC. Specifically, I used deductive coding with the most recent iteration of the proposed DTD diagnostic criteria as the indicators to code the items. I recruited another clinical psychology graduate student to be a second coder. Each of the 120 items of the ACC was coded into one of the following subscales: *emotion dysregulation* (sub-criterion B1); *somatic dysregulation* (sub-criterion B2); *impaired awareness or dissociation of emotions or body* (sub-criterion B3); *impaired capacity to describe emotions or bodily states* (sub-criterion B4); *attention bias toward or away from potential threats* (sub-criterion C1); *impaired capacity for self-protection* (sub-criterion C2); *maladaptive self-soothing* (sub-criterion C3); *habitual or reactive self-harm (non-suicidal self-injury)* (sub-criterion C4); *inability to initiate or sustain goal-directed behaviour* (sub-criterion C5); *persistent extreme negative self-perception* (sub-criterion D1); *attachment insecurity and disorganization* (sub-criterion D2); *extreme persistent distrust, defiance or lack of reciprocity in close relationships* (sub-criterion D3); *reactive physical or verbal aggression* (sub-criterion D4); *psychological boundary deficits* (sub-criterion D5); and *impaired capacity to regulate empathic arousal* (sub-criterion D6).

Following the coding procedure, I calculated Cohen's Kappa (k) to calculate inter-rater reliability. The Kappa statistic extends the percentage agreement approach by accounting for the expected agreement due to chance (Shrout & Lane, 2012; Viera & Garrett, 2005). The formula for Kappa, K is:

$$Kappa, K = \frac{(P_O - P_e)}{(1 - P_e)}$$

This formula subtracts the expected agreement from the observed agreement and divides this value by 1 minus the expected agreement (Viera & Garrett, 2005). To obtain the observed agreement, P_O, the researcher adds the number of agreements and then divides this value by the

total number of items (just as is done in percent agreement). The expected agreement, P_e, is calculated by taking a sum of the products of the percentage of a particular coding response for each rater. Kappa is a standardized measure between -1 and 1, with the following interpretation guidelines: $K < 0$ is less than chance agreement, K = 0.01-0.20 is slight agreement, K = 0.21-0.40 is fair agreement, K = 0.41-0.60 is moderate agreement, K = 0.61-0.80 is substantial agreement, and K = 0.81-0.99 is almost perfect agreement (Viera & Garrett, 2005). There was substantial agreement in raters' coding of the items for the present study: K = .78.

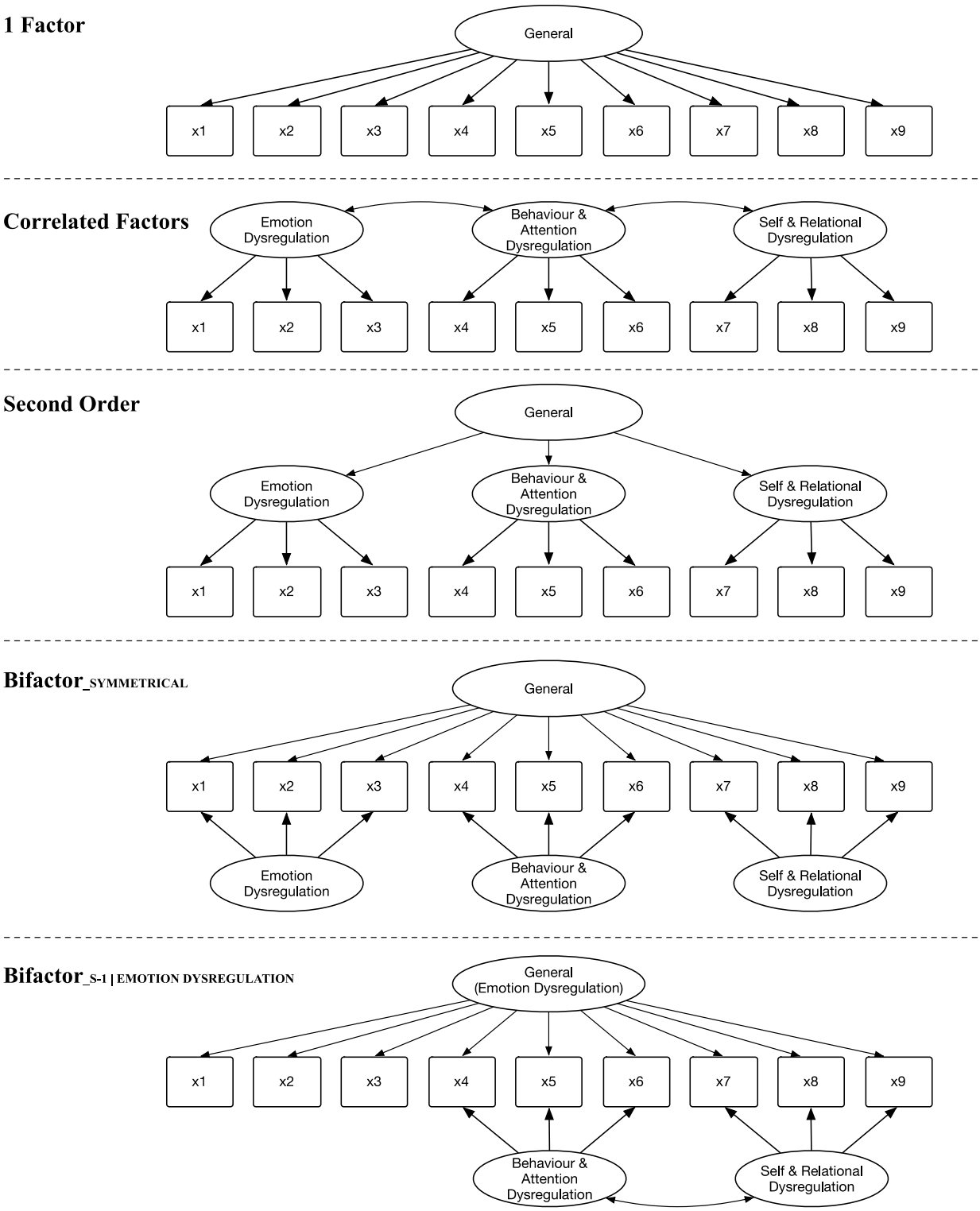
Finally, Dr. Browne and I resolved coding disagreements through discussion and consultation with the official proposal for the adoption of the DTD criteria (van der Kolk et al., 2009).

Confirmatory Factor Analysis. I conducted CFAs for a single factor, correlated specific factors, second-order, fully symmetrical bifactor, and bifactor(s-1) models. Second-order models can be useful for testing a higher-order latent dimension of general psychopathology, which influences the vulnerability to narrower facets of psychopathology characterized by specific symptomatology. The models I tested in the present research used the proposed DTD criteria—namely, affect and somatic dysregulation (criterion B), attention and behavioural dysregulation (criterion C), and self and relational dysregulation (criterion D)—as the specific factors. As a result, in addition to testing for a general liability to developmental trauma symptoms, the present research tests the proposed factor structure of the DTD criteria. It is worth noting that because the ACC does not look at traditional post-traumatic stress symptoms (criterion E), this criterion was not included in the models. In keeping with the underlying theoretical assumptions based on the reviewed literature, I modelled the latent variables as reflective constructs, with the associated symptoms (i.e., behaviours captured by the ACC items) loading onto the relevant

criterion. Specifically, the indicators were 'parcels' of ACC items reflecting particular DTD symptom sub-criterion. Parcels were constructed by averaging the commensurate measure items and rounding up to the nearest integer using the 'ceiling' function in RStudio to ensure all items had the same scale.

As discussed above, Heinrich et al. (2020a, 2020b) and Eid et al. (2017) recommend fitting bifactor models whereby a reference factor is selected *a priori* based on theoretical reasoning to define the general factor of psychopathology rather than through a data-driven approach as has been common in previous studies. Bifactor and bifactor(s-1) models differ in that the latter contains some indicators that load exclusively on the general factor and the remaining indicators loading on both the general factor and one specific factor. The indicators that load solely on the general factor become the reference domain that defines the general factor. The specific factors then represent the residual variance that is not accounted for by the general factor. Defining the general factor in this way ensures that both general and specific factors are explicit in their psychometric definition and interpretation. For the bifactor(s-1) model, I also calculated the consistency and specificity to examine the proportion of variance in the non-reference domain indicators (sub-criteria within the behavioural and attentional dysregulation and self and relational-dysregulation domains) accounted for by the emotion dysregulation general reference domain. Consistency is an estimate of the proportion of a non-reference item's true score variance determined by the reference factor, while sensitivity estimates the true score variance not determined by the reference factor (Eid et al., 2017). Figure 2 visually depicts the models tested in the present study.

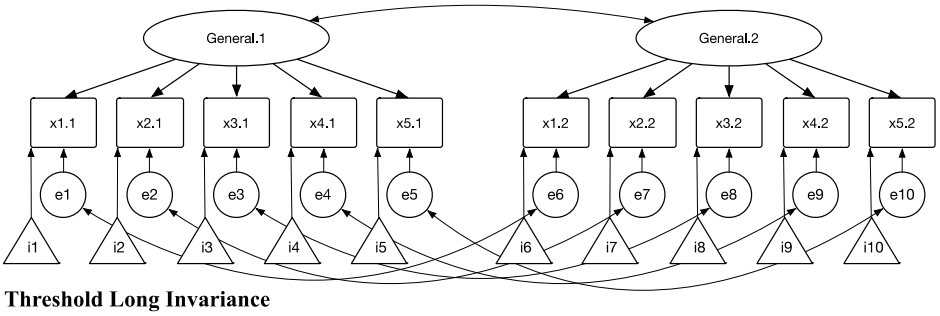
Figure 2: Models of the Structure of Psychopathology



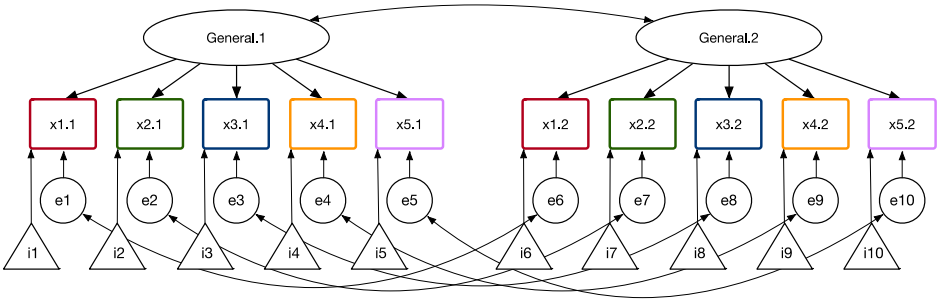
Longitudinal Measurement Invariance Testing. To test whether the structure of psychopathology was consistent across time, I tested for longitudinal measurement invariance. The purpose of testing measurement invariance was to satisfy the assumption that the models' regression parameters could be considered equal across repeated measures for the validity of extracting latent scores for future longitudinal analyses. I completed the multistep process of testing the configural, threshold, metric, scalar, and strict invariance models to determine the best-fitting model. Configural invariance indicates that the structure of the models is equal, including the number of latent factors and the indicators that load onto the latent variables. Threshold invariance tests whether the thresholds for ordinal indicators are equivalent across measurements. Weak/metric invariance indicates that the indicators load onto the factors equally for each time point. Strong/scalar invariance indicates that intercepts are equal across repeated measures. Strict invariance indicates that residual variances are equal for each time point (Hirschfeld & von Brachel, 2014). See figure 3 for a visual depiction of the various longitudinal measurement invariance models. While the sample included multiple measurements, the complexity of the measurement models and the attrition of the sample precluded testing of more than two timepoints. Additionally, the models were underpowered for testing measurement invariance for demographic covariates such as gender and care type.

Figure 3. Longitudinal Measurement Invariance Models

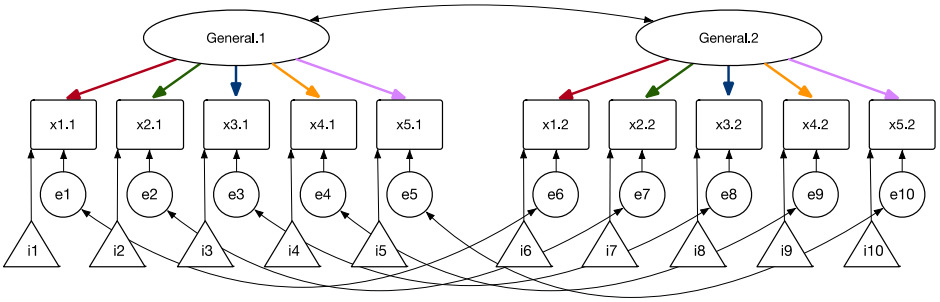
Configural Long Invariance



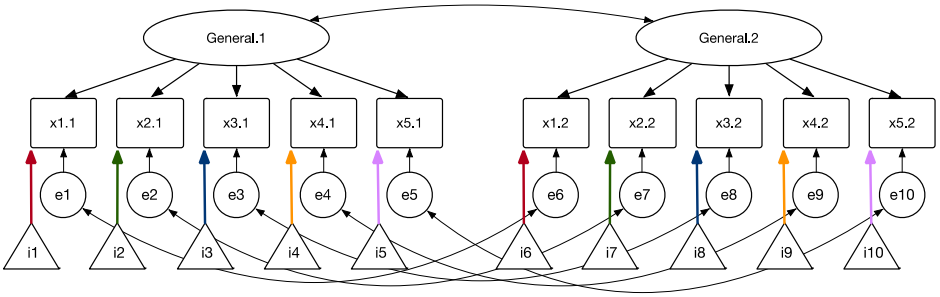
Threshold Long Invariance



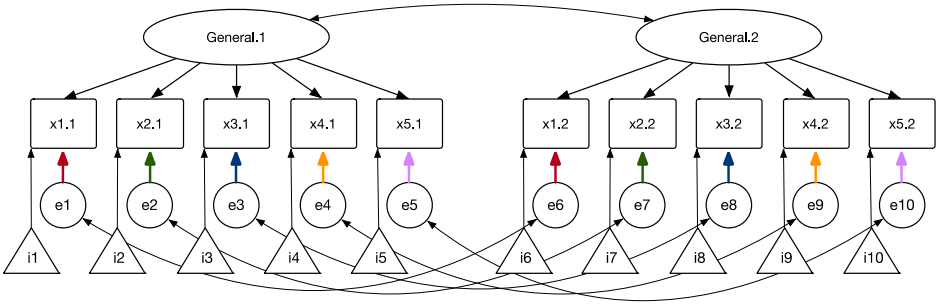
Metric Long Invariance



Scalar Long Invariance



Strict Long Invariance



I specified all models using ordinal indicators and used the weighted least square mean and variance adjusted (WLSMV) algorithm. WLSMV is a robust estimator that does not assume multivariate normality and is, therefore, most appropriate for use with categorical and ordinal data (Brown, 2015; Li, 2016). To evaluate the relative goodness of fit for the CFA models, I used the following conventional recommendations to guide model comparisons: comparative fit index (CFI) close to .95 or greater and root mean square error of approximation (RMSEA) close to .06 or below (Hu & Bentler, 1999). With that said, it is generally accepted that values tend to be higher in models using estimators for ordinal indicators, with values of .90 for CFI and .08 for RMSEA indicating adequate model fit (Brown, 2015). I conducted all analyses in R Studio version 1.3.959 (Rstudio Team, 2020) using the *Psych* (Revelle, 2018), *Lavaan* (Rosseel, 2012), and *semTools* (Jorgensen et al., 2019) packages.

Results

Part 1: Measurement of Developmental Trauma Symptoms Using the ACC

Question 1.1: Are the ACC scales appropriate proxies for DTD symptomatology, or is a reorganization of the items required to capture DTD diagnostic criteria?

To investigate whether the ACC scales are appropriate proxies for DTD symptomatology, I examined each of the ACC scales at the item level and recoded each ACC item to one of the DTD sub-criterion based on a combination of clinical judgement, the diagnostic criteria, and the descriptions of the diagnostic criteria in the proposal to the APA. I recruited a second rater to code the items separately.

The resulting codes revealed that the scales of the ACC vary in the degree to which they are consistent with the DTD criteria and explain why the existing ACC subscales could not be neatly structured according to the DTD diagnostic framework. The content analysis showed that a few of the ACC scales were consistent with the DTD criteria and that most of the ACC scales consisted of items that related to multiple DTD diagnostic criteria and sub-criteria. For example, all the items within the negative self-image mapped onto a single DTD sub-criterion (sub-criterion D1: self-loathing). The items in the other ACC scales were less cohesive, with the *insecure interpersonal behaviour*, *non-reciprocal interpersonal behaviour*, and *other items* scales having the broadest spread of items according to the DTD criteria. Table 2 provides a detailed distribution of the ACC items coded to the DTD criteria.

Table 2. Overlap of ACC Scales and DTD Criteria.

ACC Scales	Developmental Trauma Disorder Criteria															# of DTD Sub-Criteria	# of DTD Criteria
	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6		
Insecure	1	-	-	-	3	-	-	-	-	-	1	6	-	2	-	5	3/3
Non-reciprocal	-	-	-	-	-	1	-	-	-	-	-	8	-	-	3	3	2/3

Anxious-Distrustful	2	-	-	-	5	-	1	-	-	-	-	2	-	-	-	4	3/3
Low Confidence	-	-	-	-	-	-	-	-	7	1	-	-	-	-	-	2	2/3
Other Items	-	-	1	-	-	2	1	1	2	-	-	-	-	2	-	6	3/3
Pseudomature	-	-	-	-	-	1	-	-	-	-	3	-	1	-	1	4	2/3
Self-Injury Total	-	-	-	-	-	2	4	8	-	-	-	-	-	-	-	3	1/3
Suicide Discourse	5	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	2/3
Abnormal Pain Response	-	-	2	-	-	-	1	-	-	-	-	1	-	-	-	3	3/3
Food Maintenance	-	-	-	-	1	-	2	-	-	-	-	1	-	-	-	3	2/3
Indiscriminate	-	-	-	-	-	1	-	-	1	-	-	1	-	5	-	4	2/3
Negative Self-Image	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	1	1/3
Sexual Behaviour	-	-	-	-	-	-	-	-	-	-	-	-	1	10	-	2	1/3
Composite Self Esteem	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1/3
Total Number of Items	**8**	**0**	**3**	**0**	**9**	**8**	**9**	**9**	**10**	**11**	**4**	**19**	**2**	**19**	**4**	**-**	**-**

Note: The table does not include the six ACC items that were coded as "N/A" and thus were not included in the final DTD scales.

Question 1.2: Do the items of the ACC comprehensively capture the symptomatology included in the DTD diagnostic criteria?

After the final DTD scales were created with the items of the ACC, 12 of the 15 sub-criteria were made up of three or more items ($M = 9.58$, max = 19). One sub-criterion scale (D4: reactive verbal or physical aggression) had only two ACC items assigned. Two (sub-criterion B2: somatic dysregulation, sub-criterion B4: impaired capacity to describe emotions or bodily states) did not have any items assigned. Table 3 provides details of the number of items assigned to each of the DTD criteria and the internal consistency (Cronbach's α) of each of the newly created scales, including the full criteria and sub-criteria. Internal consistency was good for criterion C (attention and behavioural dysregulation; α = .84, *95% CI* = .82, .86) and criterion D (self and relational dysregulation; α = .90, *95% CI* = .89, .91) and poor for criterion B (affect or somatic dysregulation; α = .68, *95% CI* = .64, .72).

Table 3. ACC Items Coded to Developmental Trauma Disorder Criteria and Internal Reliability of the DTD Criteria Scales.

Proposed Developmental Trauma Disorder Criteria	**# of**	**Cronbach's**

	Items	α
B: Emotion or somatic dysregulation	**11**	**.68**
B1: Emotion dysregulation	8	.74
B2: Somatic dysregulation	0	-
B3: Impaired awareness or dissociation of emotions or body	3	.29
B4: Impaired capacity to describe emotions or bodily states	0	-
C: Attentional or behavioral dysregulation	**45**	**.84**
C1: Attention bias towards or away from potential threat	9	.66
C2: Impaired capacity for self-protection	8	.54
C3: Maladaptive self-soothing	9	.49
C4: Habitual or reactive self-harm (non-suicidal self-injury)	9	.69
C5: Inability to initiate or sustain goal-directed behavior	10	.76
D: Relational or Self Dysregulation	**59**	**.90**
D1: Persistent extreme negative self-perception	11	.91
D2: Attachment insecurity and disorganization	4	.62
D3: Extreme persistent distrust, defiance, or lack of reciprocity in close relationships	19	.81
D4: Reactive verbal or physical aggression	2	.10
D5: Psychological boundary deficits	19	.74
D6: Impaired capacity to regulate empathic arousal	4	.66
** ACC items not applicable to DTD criteria	6	-

Sample Statistics with the DTD Criteria Proxy Scales

I ran descriptive analyses of children's baseline psychosocial functioning using the DTD proxy scales. Table 4 presents the number of items, mean, and standard deviations for each of the DTD scales developed using the items of the ACC. For descriptive purposes, if any of the items corresponding to a DTD sub-criterion were endorsed, I coded that sub-criterion as being present.

Table 4. Developmental Trauma Disorder Scale Descriptive Statistics Using ACC Items.

DTD Scale	# of Items	Mean	Std Dev
B	**11**	**3.03**	**3.14**
B1	8	2.20	2.81
B2	0	N/A	N/A
B3	3	0.83	1.10
B4	0	N/A	N/A
C	**45**	**21.94**	**10.18**
C1	9	3.78	3.07
C2	8	4.03	2.38
C3	9	2.44	2.26

C4	9	2.16	2.75
C5	10	9.53	4.26
D	**59**	**29.84**	**15.42**
D1	11	6.80	5.77
D2	4	2.28	2.02
D3	19	10.19	6.28
D4	2	0.80	0.86
D5	19	6.74	4.57
D6	4	3.02	2.15

While the DTD scales do not have normative clinical cut-offs, the diagnostic criteria indicate the minimum number of sub-criteria in which children are required to show symptoms for the diagnostic criteria to be met. The proportion of children in the sample that have exhibited behaviours to meet the DTD diagnostic criteria are presented in Table 5. The criteria thresholds are based on those used by Ford et al. (2018) in their validation study for the Developmental Trauma Disorder Semi-Structured Interview. I averaged children's scores on the new DTD scales and assigned a binary code indicating the presence or absence of the symptom sub-criterion to determine criterion counts (symptom not present: average scale score < 1; symptom present: average scale score ≥ 1). If the summed symptom counts met the diagnostic threshold, I assigned a binary code indicating that they met overall criteria. It is worth noting that, due to the lack of items that captured the affective and somatic dysregulation domain (criterion B), I could not calculate the proportion of children in the present sample who meet the clinical threshold for criterion B. Furthermore, as a result I also could not calculate the overall DTD criteria.

Table 5. Proportion of Children Who Meet Criteria for DTD Criteria.

Diagnostic criteria	DTD Symptom Criteria	# of children	% of children
	B	**N/A**	**N/A**
3 / 4 sub-criteria required for	B1	348	62.70
Affective and Somatic	B2	N/A	N/A
Dysregulation	B3	256	46.10
	B4	N/A	N/A
	C	**550**	**99.10**
	C1	484	87.21

	C2	532	95.86
2 / 5 sub-criteria required for	C3	440	79.28
Attentional and Behavioural	C4	328	59.10
Dysregulation	C5	551	99.28
	D	**548**	**98.74**
	D1	471	84.86
2 / 6 sub-criteria required for	D2	430	77.48
Self and Relational	D3	537	96.76
Dysregulation	D4	303	54.59
	D5	539	97.12
	D6	474	85.41

Part 2: Structure of Developmental Trauma Disorder Symptomatology

In the second part of this study, I conducted confirmatory factor analyses to test the relationship between the DTD sub-criteria (model indicators) and general/specific latent factors of psychopathology. Additionally, I tested this for longitudinal measurement invariance across two repeated measures. Fit statistics are separately presented for corresponding models in tables 7, 9, 11, 13, and 15 as well as in a single comprehensive table in Appendix B. Standardized regression coefficients are presented in separate tables. CFA model plots with standardized factor loadings are presented in Appendix C.

I examined the structure of DTD symptomatology by testing one factor, three (correlated) factors, second order, symmetrical bifactor, and bifactor(s-1) models. Additionally, I tested each of these models using two approaches to specifying the measurement models to determine which approach is more appropriate for assessing the structure of DTD symptoms using the ACC. I fit the first set of models using the DTD criteria scales developed in the first part of the study as the indicators. I fit the second set of models using a hybrid indicators approach, using both DTD sub-criteria and individual ACC items (specifically those in the emotion dysregulation scale). The hybrid models did not include the items or criteria for somatic dysregulation due to the small number of indicators and non-significant factor loadings. Due to convergence issues with the

models using sub-criteria as the indicators, only the results of the hybrid indicator models are presented below.

Question 2.1: Can developmental trauma symptoms be explained by a single factor of psychopathology?

First, I tested whether a single factor of psychopathology could account for the variance in the DTD symptoms (see Figure 4). The hybrid indicators single factor model fit the data adequately using the baseline data: $\chi^2 = 694.81(152, N = 555)$; CFI = .91; RMSEA = .08, 90% CI = [.07, .09]. Model fit for the single factor using the data from the second assessment fell below the suggested criteria for adequate fit (CFI > .90): $\chi^2 = 725.21(152, N = 326)$; CFI = .88; RMSEA = .11, 90% CI = [.10, .12]. Table 6 provides standardized factor loadings for single factor models fit with data from Time 1 and Time 2. Standardized factor loadings were all positive and loaded significantly on the single factor (p. <.001 for all indicators). Average standardized factor loadings were moderate (Time 1 = .604; Time 2 = .620).

In addition to the individual models for Time 1 and Time 2, I conducted longitudinal measurement invariance testing to assess whether the ACC items can produce the single factor model consistently over repeated measurements. Table 7 presents the fit statistics for each individual model and for the configural, threshold, metric, scalar, and strict invariance models. Based on the criteria of a <.01 difference in CFI between measurement invariance models, the single factor model achieved strict invariance, indicating that the structure, loadings, indicator thresholds, intercepts, and residuals are comparable for the single factor model using Time 1 and Time 2 data.

Figure 4: Hybrid 1 Factor Model with Standardized Factor Loadings

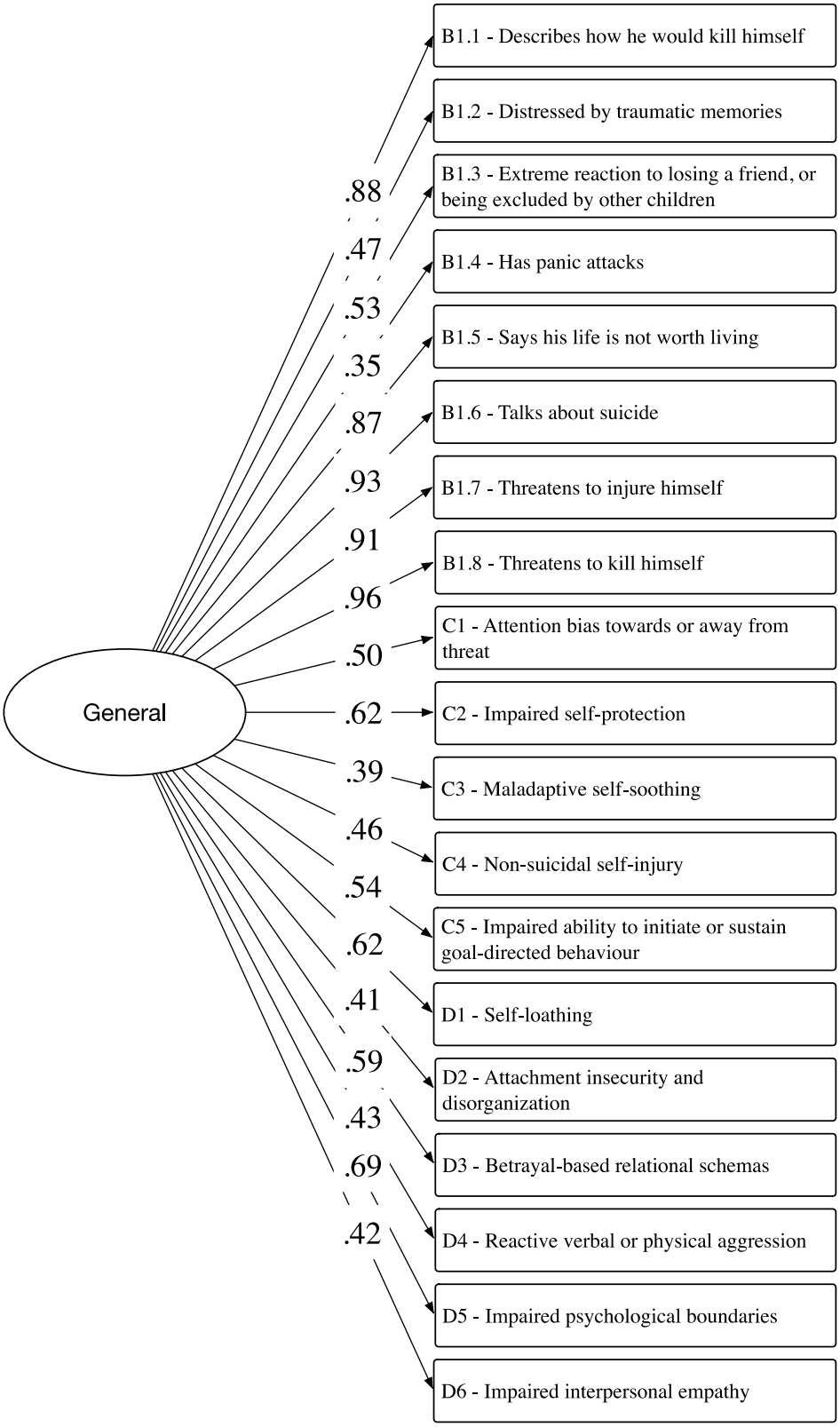


Table 6. Factor Loadings for Hybrid 1 Factor Model.

	Time 1	Time 2
Indicators	P	P
B1.1	0.88	0.91
B1.2	0.47	0.60
B1.3	0.53	0.56
B1.4	0.35	0.53
B1.5	0.87	0.78
B1.6	0.93	0.89
B1.7	0.91	0.90
B1.8	0.96	0.97
C1	0.50	0.72
C2	0.62	0.57
C3	0.39	0.42
C4	0.46	0.42
C5	0.54	0.50
D1	0.62	0.61
D2	0.41	0.37
D3	0.59	0.68
D4	0.43	0.56
D5	0.69	0.34
D6	0.42	0.47

Table 7. Repeated Measures Measurement Invariance for the Hybrid 1 Factor Model.

Models	**N Pars**	**χ^2**	**df**	**CFI**	**RMSEA**	**RMSEA 95% CI**
Time 1	57	694.812	152	.912	.080	[.074, .086]
Time 2	57	725.208	152	.878	.108	[.100, .116]
Configural	147	1663.014	798	.894	.044	[.041, .047]
Threshold	147	1663.014	798	.894	.044	[.041, .047]
Metric	128	1675.336	817	.895	.044	[.041, .047]
Scalar	109	1686.991	836	.896	.043	[.040, .046]
Strict	**89**	**1707.31**	**856**	**.896**	**.042**	**[.039, .045]**

Question 2.2: Can developmental trauma symptoms be explained by three dimensions of psychopathology (Proposed DSM Criteria Model)?

Next, I tested a correlated three factor model (see Figure 5). This model follows the specific structure of DTD provided in the proposal, with each of the sub-criterion loading onto one of three factors: (1) affective and somatic dysregulation (criterion B); (2) attentional and

behavioural dysregulation (criterion C); and (3) self and relational dysregulation (criterion D). No cross-loadings were permitted; however, given that the specific factors in this model were defined based on the DTD diagnostic criteria, the co-occurrence of the specific dysregulation factors is expected. Thus, the model assumes that the factors are correlated.

Table 8 shows the standardized factor loadings and the correlations for the hybrid indicators model using the ACC items for the emotion dysregulation factor and the DTD sub-criteria scales as the indicators for the attentional and behavioural dysregulation and self and relational dysregulation factors. The baseline model fit the data well: $\chi^2 = 507.13(149, N = 555)$; CFI = .94; RMSEA = .066, 90% CI = [.06, .07]. The model also fit well using the data from the second assessment, though worse than the baseline model due to the smaller sample: $\chi^2 = 508.92(149, N = 326)$; CFI = .92; RMSEA = .09, 90% CI = [.08, .09]. Additionally, all indicators positively and significantly (at $p < .001$) loaded onto the specific factors and the correlations between the factors were positive for both Time points. Factor correlations for Time 1 model ranged from .61 (between emotion dysregulation and self and relational dysregulation) to .90 (between attentional and behavioural dysregulation and self and relational dysregulation). Factor correlations for Time 2 model ranged from .46 (between emotion dysregulation and self and relational dysregulation) to .91 (between attentional and behavioural dysregulation and self and relational dysregulation). Given the near perfect interfactor correlation between attentional and behavioural dysregulation and self and relational dysregulation, distinguishing between the two latent constructs in a three-factor model may not be necessary. Average standardized factor loadings were moderate: emotion dysregulation: T1 = .76, T2 = .79; attentional and behavioural dysregulation: T1 = .60, T2 = .61; self and relational dysregulation: T1 = .61, T2 = .66.

In addition to the individual models for Time 1 and Time 2, I conducted longitudinal measurement invariance testing to assess whether the ACC items can produce the correlated three factor model consistently over repeated measurements. Table 9 presents the fit statistics for each individual model and for the configural, threshold, metric, scalar, and strict invariance models. Based on the criterion of a <.01 difference in CFI between measurement invariance models, the correlated three factor model achieved strict invariance, indicating that the structure, loadings, indicator thresholds, intercepts, and residuals are comparable for the correlated three factor model using Time 1 and Time 2 data.

Figure 5: Hybrid Correlated Factors Model with Standardized Factor Loadings

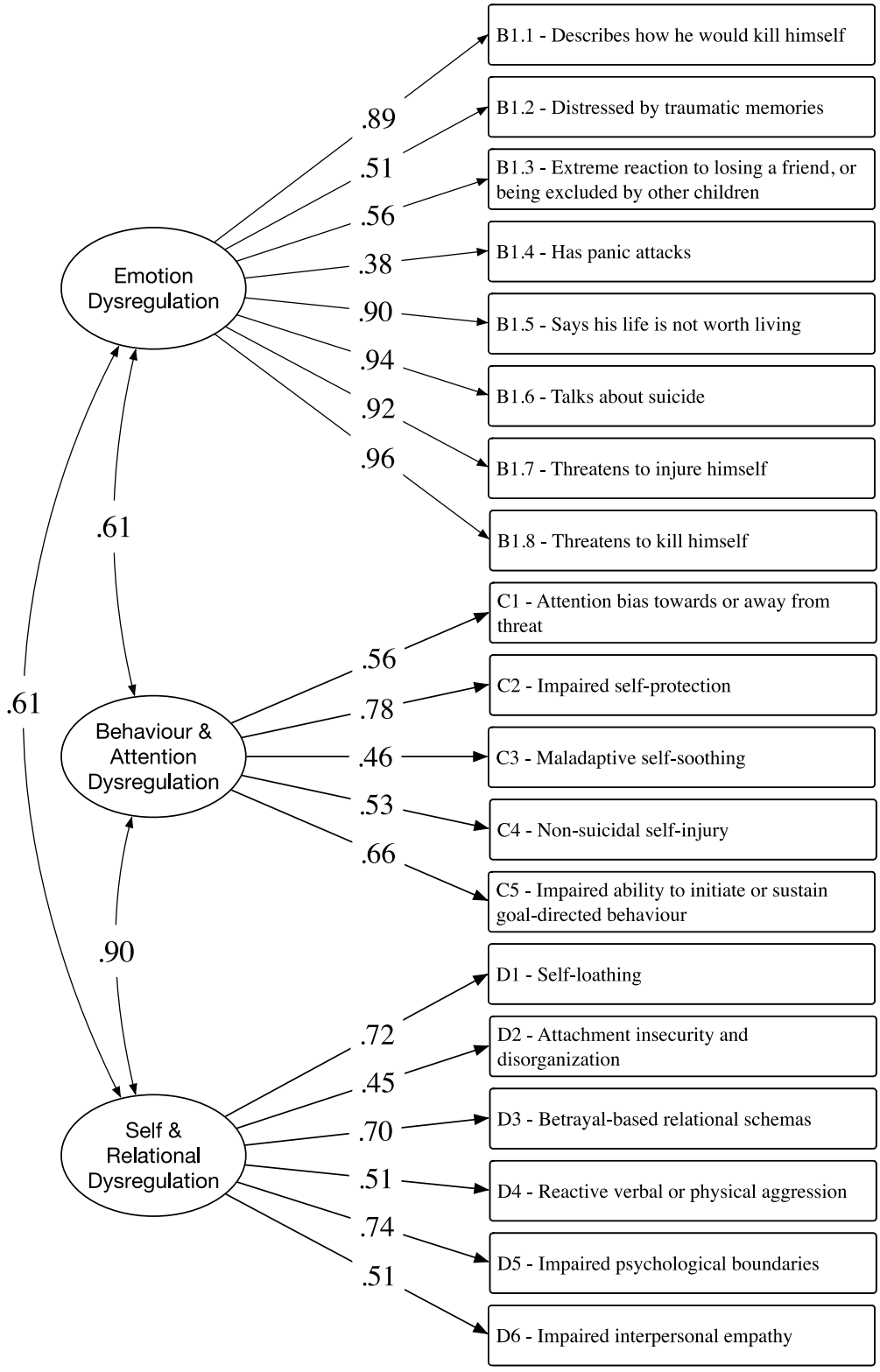


Table 8. Factor Loadings and Correlations for the Hybrid Correlated Three Factor Model

	Time 1			Time 2		
Indicators	Emotion	Behaviour & Attention	Self & Relational	Emotion	Behaviour & Attention	Self & Relational
B1.1	0.89	-	-	0.93	-	-
B1.2	0.51	-	-	0.64	-	-
B1.3	0.56	-	-	0.57	-	-
B1.4	0.38	-	-	0.57	-	-
B1.5	0.90	-	-	0.82	-	-
B1.6	0.94	-	-	0.91	-	-
B1.7	0.92	-	-	0.91	-	-
B1.8	0.97	-	-	0.97	-	-
C1	-	0.56	-	-	0.80	-
C2	-	0.78	-	-	0.68	-
C3	-	0.46	-	-	0.50	-
C4	-	0.53	-	-	0.48	-
C5	-	0.66	-	-	0.57	-
D1	-	-	0.72	-	-	0.71
D2	-	-	0.45	-	-	0.48
D3	-	-	0.70	-	-	0.81
D4	-	-	0.51	-	-	0.69
D5	-	-	0.74	-	-	0.68
D6	-	-	0.52	-	-	0.61
Factor Correlations						
Behaviour & Attention	.61			.64		
Self & Relational	.61	.90		.46	.91	

Table 9. Repeated Measures Measurement Invariance for the Hybrid Correlated 3 Factor Model.

Models	**N Pars**	**χ^2**	**df**	**CFI**	**RMSEA**	**RMSEA 95% CI**
T0	60	507.128	149	.942	.066	[.060, .072]
T1	60	508.915	149	.923	.086	[.078, .094]
Configural	148	1164.472	631	.936	.039	[.036, .043]
Threshold	148	1164.471	631	.936	.039	[.036, .043]
Metric	132	1172.639	647	.937	.038	[.035, .042]
Scalar	116	1186.169	663	.937	.038	[.034, .041]
Strict	**97**	**1203.132**	**682**	**.937**	**.037**	[.034, .041]

Question 2.3: Can developmental trauma symptoms be explained by a general factor of

psychopathology (p-factor), beyond the specific dimensions?

To test the existence of a general psychopathology factor that accounted for the variance in the expression of DTD symptoms beyond the specific factors, I tested a second order model, a fully symmetrical bifactor model, and a bifactor model whereby the general factor is defined by a subset of indicators in the model (in this study, the indicators for the emotion dysregulation factor). The results of each of these models are presented below.

Second Order Model. The second order model (see Figure 6) specifies that the variance in the three specific factors (1) affective and somatic dysregulation (criterion B); (2) attentional and behavioural dysregulation (criterion C); and (3) self and relational dysregulation (criterion D) is caused by a factor of psychopathology and thus accounts for the factor correlations in the correlated three factor model. To specify the second order model, all indicators load onto a single specific factor (like in the correlated factors model) and the specific factors load onto the general factor. No cross-loadings were permitted. Table 10 shows the standardized factor loadings for the second order hybrid indicators model using the ACC items for the emotion dysregulation factor and the DTD sub-criteria scales as the indicators for the attentional and behavioural dysregulation and self and relational dysregulation factors. The baseline model fit the data well and had identical fit statistics to the correlated three factors model: $\chi^2 = 507.13(149, N = 555)$; CFI = .94; RMSEA = .07, 90% CI = [.06, .07]. The model failed to converge when fit with Time 2.

All loadings for the Time 1 model were positive. However, all indicators that loaded onto the self and relational dysregulation specific factor and the loading of the self and relational dysregulation factor on the higher-order general factor were non-significant. All other loadings were significant at $p < .05$. Average standardized factor loadings for the specific factors were

moderate: emotion dysregulation: T1 = .76; attentional and behavioural dysregulation: T1 = .60; self and relational dysregulation: T1 = .61. Average loading for the general factor was strong at .85. Due to the convergence issue with the Time 2 model, I did not test for longitudinal measurement invariance for the second order model (see Table 11).

Figure 6: Hybrid Second Order Model with Standardized Factor Loadings

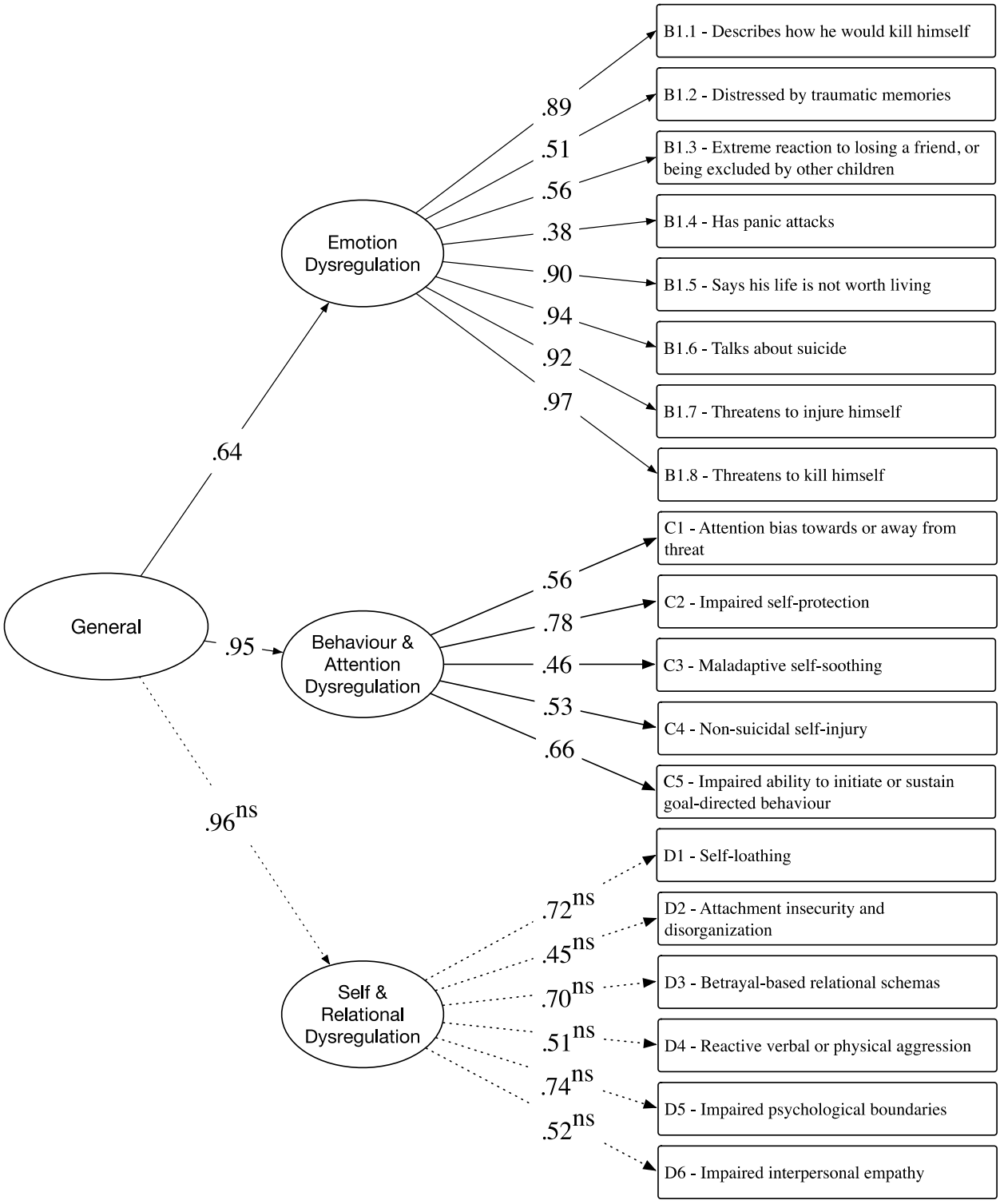


Table 10: Factor Loadings for Hybrid Second Order Factor Models

	Time 1				Time 2			
Indicators	P	Emotion	Behaviour & Attention	Self & Relational	P	Emotion	Behaviour & Attention	Self & Relational
B1.1	-	0.89	-	-	-	-	-	-
B1.2	-	0.51	-	-	-	-	-	-
B1.3	-	0.56	-	-	-	-	-	-
B1.4	-	0.38	-	-	-	-	-	-
B1.5	-	0.90	-	-	-	-	-	-
B1.6	-	0.94	-	-	-	-	-	-
B1.7	-	0.92	-	-	-	-	-	-
B1.8	-	0.97	-	-	-	-	-	-
C1	-	-	0.56	-	-	-	-	-
C2	-	-	0.78	-	-	-	-	-
C3	-	-	0.46	-	*Model Did not Converge*			
C4	-	-	0.53	-	-	-	-	-
C5	-	-	0.66	-	-	-	-	-
D1	-	-	-	0.72^{ns}	-	-	-	-
D2	-	-	-	0.45^{ns}	-	-	-	-
D3	-	-	-	0.70^{ns}	-	-	-	-
D4	-	-	-	0.51^{ns}	-	-	-	-
D5	-	-	-	0.74^{ns}	-	-	-	-
D6	-	-	-	0.52^{ns}	-	-	-	-
Emotion	0.64	-	-	-	-	-	-	-
Beh. & Attn.	0.95	-	-	-	-	-	-	-
Self & Relational	0.96^{ns}	-	-	-	-	-	-	-

Note: ns = Non-significant factor loading.

Table 11: Repeated Measures Measurement Invariance for the Hybrid Second Order Model

Models	**N Pars**	**χ^2**	**df**	**CFI**	**RMSEA**	**RMSEA 95% CI**
T0	60	507.128	149	.942	.066	[.060, .072]
T1	NA	NA	NA	NA	NA	NA
Measurement Invariance not tested due to errors with separate models						

Symmetrical Bifactor Model. The symmetrical bifactor model (see Figure 7) tests the degree to which the variance in the indicators (symptoms) can be accounted for by an uncorrelated specific factor (affective and somatic dysregulation, attentional and behavioural

dysregulation, or self and relational dysregulation) versus a general factor of psychopathology. I specified all to be orthogonal and loaded all indicators onto a single specific factor as well as the general psychopathology factor. Table 12 shows the standardized factor loadings for the symmetrical bifactor hybrid indicators model. The baseline model fit the data well: $\chi^2 = 301.77$ (133, $N = 555$); CFI = .97; RMSEA = .05, 90% CI = [.04, .06]. When fit with the Time 2 data, the model fit statistics also indicated a good-fitting model: $\chi^2 = 244.80$ (133, $N = 326$); CFI = .98; RMSEA = .05, 90% CI = [.04, .06]. However, consistent with previous research looking at the *p*-factor, anomalous results that make the model uninterpretable (negative and non-significant factor loadings) were present. Due to the modelling issues, I did not proceed with longitudinal measurement invariance testing (see Table 13).

Figure 7: Hybrid Symmetrical Bifactor Model with Standardized Factor Loadings

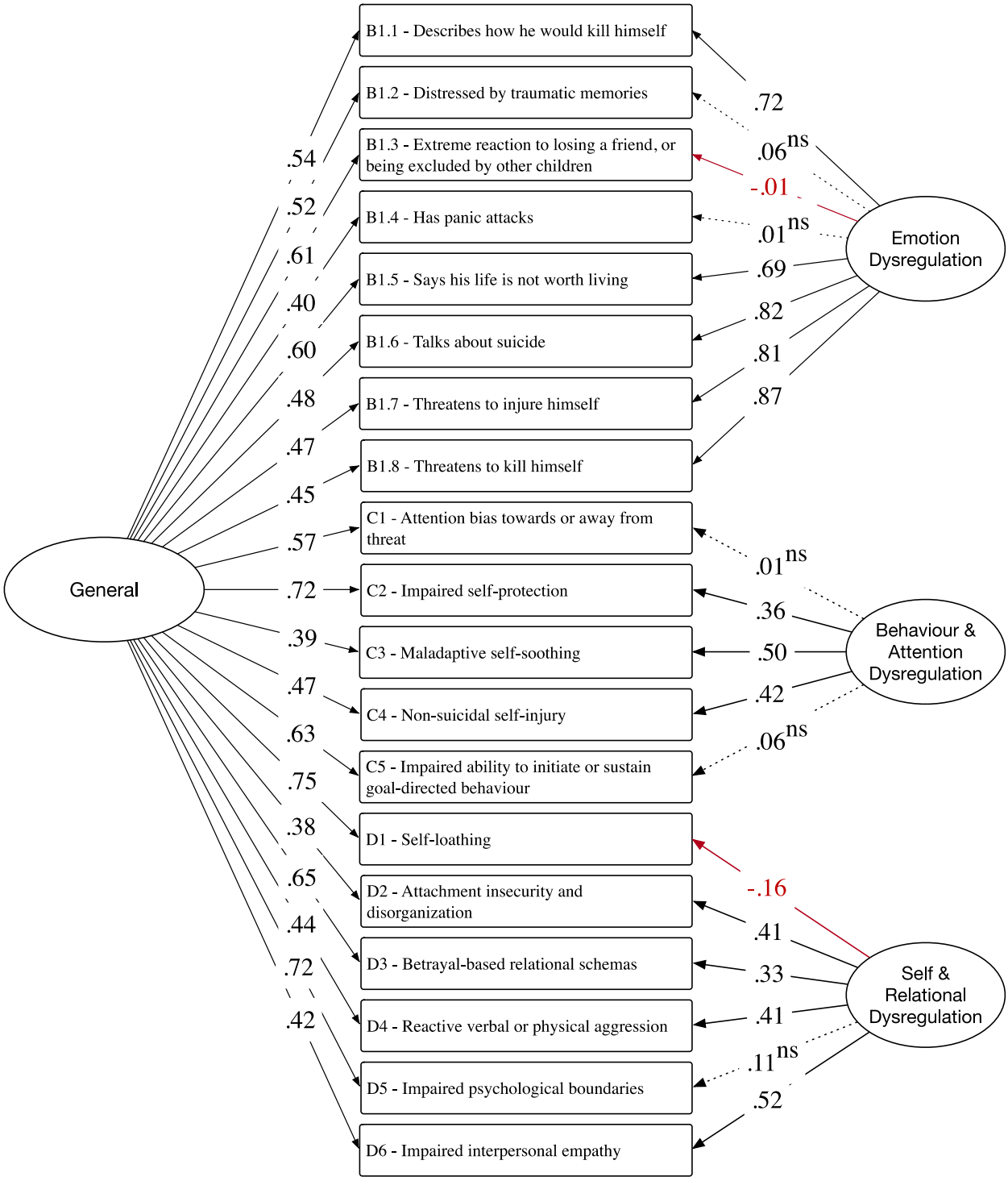


Table 12: Factor Loadings for Hybrid Symmetrical Bifactor Factor Models

Indicators	Time 1				Time 2			
	P	Emotion	Behaviour & Attention	Self & Relational	P	Emotion	Behaviour & Attention	Self & Relational
B1.1	0.54	0.72	-	-	0.34	0.88	-	-
B1.2	0.52	0.06^{ns}	-	-	0.68	0.05^{ns}	-	-
B1.3	0.61	-0.01	-	-	0.67	-0.01	-	-
B1.4	0.40	0.01^{ns}	-	-	0.52	0.25	-	-
B1.5	0.60	0.69	-	-	0.50	0.68	-	-
B1.6	0.48	0.82	-	-	0.34	0.87	-	-
B1.7	0.47	0.81	-	-	0.37	0.86	-	-
B1.8	0.45	0.87	-	-	0.43	0.87	-	-
C1	0.57	-	0.01^{ns}	-	0.82	-	-0.25	-
C2	0.72	-	0.36	-	0.67	-	0.22^{ns}	-
C3	0.39	-	0.50	-	0.45	-	0.70	-
C4	0.47	-	0.42	-	0.44	-	0.30	-
C5	0.63	-	0.06^{ns}	-	0.55	-	0.27	-
D1	0.75	-	-	-0.16	0.75	-	-	-0.25
D2	0.38	-	-	0.41	0.40	-	-	0.35
D3	0.65	-	-	0.33	0.77	-	-	0.01^{ns}
D4	0.44	-	-	0.41	0.54	-	-	0.83
D5	0.72	-	-	0.11^{ns}	0.66	-	-	0.44
D6	0.42	-	-	0.53	0.51	-	-	0.34

Note: ns = Non-significant factor loading.

Table 13: Repeated Measures Measurement Invariance for the Symmetrical Bifactor Model

Models	N Pars	χ^2	df	CFI	RMSEA	RMSEA 95% CI
T0	76	301.769	133	.973	.048	[.041, .055]
T1	76	244.804	133	.976	.051	[.041, .061]
Measurement Invariance not tested due to errors with separate models						

Bifactor(s-1) Model. I fit the bifactor(s-1) model (see Figure 8) using emotion dysregulation as the general reference factor (also referred to as bifactor$_{\text{EMOTION DYSREGULATION}}$). While previous research has based their decision for which specific factor to drop on the results of the symmetrical bifactor model results, I chose emotion dysregulation as the general reference factor based on empirical and theoretical reasons. This model also allows for the remaining specific factors to be correlated.

As expected, based on Eid et al.'s (2017) article, the bifactor$_{\text{EMOTION DYSREGULATION}}$ model solved the issues that were present in the symmetrical bifactor models. Table 14 shows the standardized factor loadings fit with data from Time 1 and Time 2. The baseline model fit the data well: $\chi^2 = 472.90(140, N = 555)$; CFI = .95; RMSEA = .07, 90% CI = [.06, .07]. The model with Time 2 data also had acceptable fit statistics: $\chi^2 = 463.24(140, N = 326)$; CFI = .93; RMSEA = .08, 90% CI = [.08, .09]. Additionally, all indicators positively and significantly loaded onto the specific and general factors and the correlations between the factors were positive and significant at both time points. Correlations for attentional and behavioural dysregulation and self and relational dysregulation specific factors were .84[3] at Time 1 and .86 at Time 2. Average standardized factor loadings were moderate: P: T1 = .53, T2 = .53; attentional and behavioural dysregulation: T1 = .47, T2 = .48; self and relational dysregulation: T1 = .50, T2 = .61.

In addition to the individual models for Time 1 and Time 2, I conducted longitudinal measurement invariance testing to assess whether the ACC items can produce the bifactor$_{\text{EMOTION DYSREGULATION}}$ model consistently over repeated measurements. Table 15 presents the fit statistics for each individual model and for the configural, threshold, metric, scalar, and strict invariance models. Based on the criterion of a <.01 difference in CFI between measurement invariance models, the bifactor$_{\text{EMOTION DYSREGULATION}}$ model achieved strict invariance, indicating that the structure, loadings, indicator thresholds, intercepts, and residuals

[3] It is worth noting that the total correlation between the attentional and behavioural dysregulation and self and relational specific factor was r = .33 and that approximately 40% of this correlation was accounted for by the common cause. Thus, the .84 interfactor correlation at T1 is specific to the remaining 60% of the variance in the expression of the factors not accounted for by the general emotion dysregulation factor.

are comparable for the bifactor_EMOTION DYSREGULATION model using Time 1 and Time 2 data (see Table 16).

Figure 8: Hybrid Bifactor_EMOTION DYSREGULATION Model with Standardized Factor Loadings

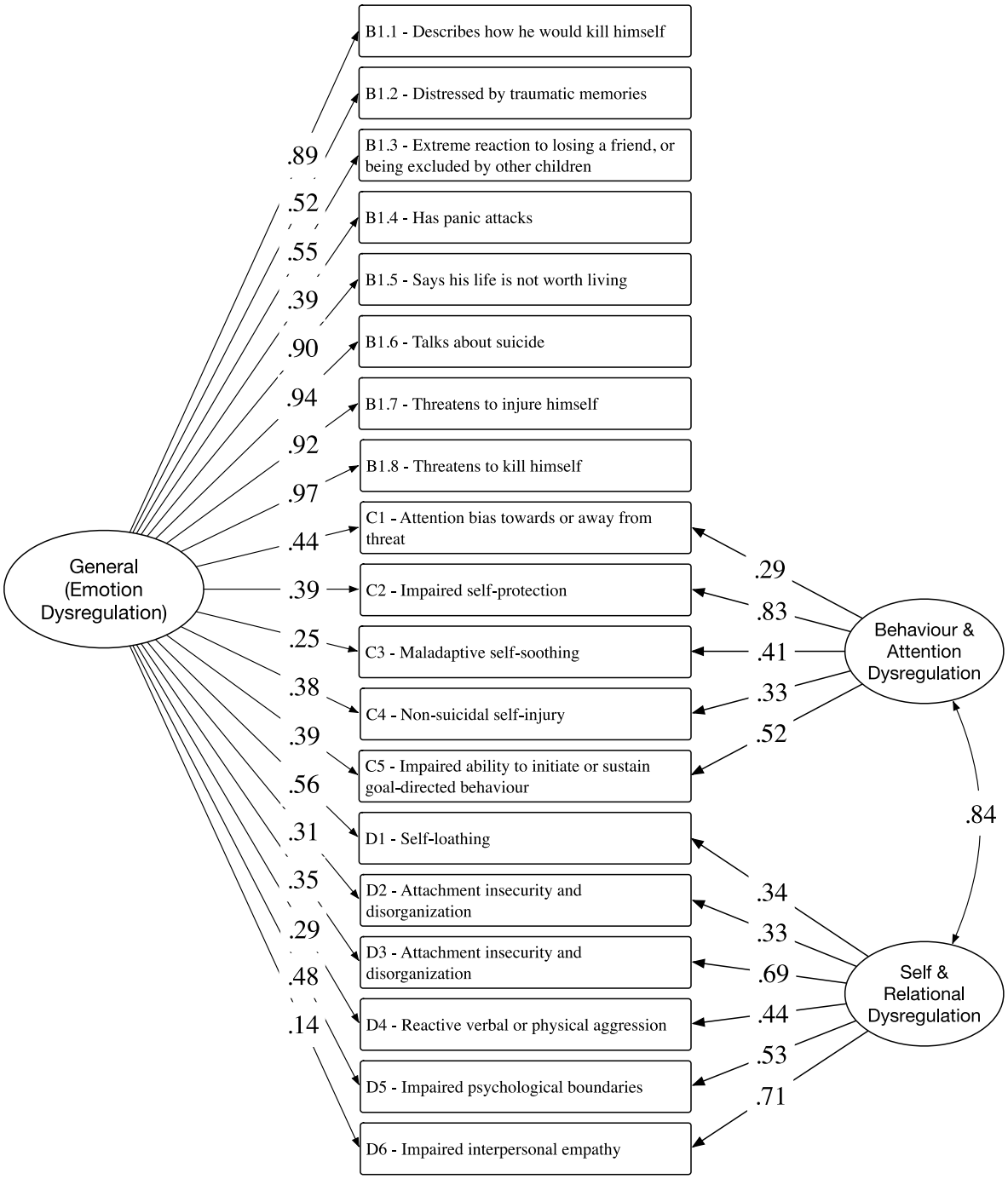


Table 14: Factor Loadings for Hybrid Bifactor_EMOTION DYSREGULATION Factor Models

Indicators	Time 1			Time 2		
	P	Behaviour & Attention	Self & Relational	P	Behaviour & Attention	Self & Relational
B1.1	0.89	-	-	0.93	-	-
B1.2	0.52	-	-	0.63	-	-
B1.3	0.55	-	-	0.56	-	-
B1.4	0.39	-	-	0.58	-	-
B1.5	0.90	-	-	0.82	-	-
B1.6	0.94	-	-	0.91	-	-
B1.7	0.92	-	-	0.92	-	-
B1.8	0.97	-	-	0.97	-	-
C.1	0.44	0.29	-	0.56	0.56	-
C.2	0.39	0.83	-	0.36	0.63	-
C.3	0.25	0.41	-	0.24	0.51	-
C.4	0.38	0.33	-	0.36	0.29	-
C.5	0.39	0.52	-	0.40	0.39	-
D.1	0.56	-	0.34	0.56	-	0.30
D.2	0.31	-	0.33	0.17	-	0.48
D.3	0.35	-	0.69	0.41	-	0.67
D.4	0.29	-	0.44	0.30	-	0.64
D.5	0.48	-	0.53	0.24	-	0.90
D.6	0.14	-	0.71	0.20	-	0.66
Factor Correlations						
Behaviour & Attention			.84			.86

Table 15: Repeated Measures Measurement Invariance for the Bifactor_EMOTION DYSREGULATION Model

Models	N Pars	χ^2	df	CFI	RMSEA	RMSEA 95% CI
T0	69	472.904	140	.946	.066	[.059, .072]
T1	69	463.236	140	.931	.084	[.076, .093]
Configural	160	1076.441	619	.945	.037	[.033, .040]
Threshold	160	1076.441	619	.945	.037	[.033, .040]
Metric	133	1087.297	646	.947	.035	[.031, .039]
Scalar	117	1099.369	662	.948	.035	[.031, .038]
Strict	**98**	**1115.409**	**681**	**.948**	**.034**	[.030, .037]

Question 2.4: What happens to the specific factors after the effect of the general factor is extracted?

Comparing the factor loadings in the correlated-factors model versus the bifactor_EMOTION DYSREGULATION model allows for an estimation of the unique variance that is accounted for by the

attentional and behavioural dysregulation and self and relational dysregulation factors once the effect of emotion dysregulation is removed (see Table 16). This can be useful for determining the relative importance of emotion dysregulation versus the specific factors in explaining the presence of developmental trauma symptoms in children who have been maltreated. If the loadings of the symptoms (sub-criteria loading onto each specific factor) are reduced from the correlated-factors model to the bifactor$_{\text{EMOTION DYSREGULATION}}$ model, this indicates that the presence of a particular symptom is more indicative of emotion dysregulation than the specific factor on which it is loaded. Factor loadings were considered statistically different between models if the 95% confidence intervals for the loadings did not overlap.

For the attentional and behavioural dysregulation factor, the factor loading for attention bias toward or away from potential threats (sub-criterion C1) was the only criteria that showed a statistically significant decrease after accounting for the influence of emotion dysregulation. This indicates that much of the propensity to this symptom in childhood is indicative of emotion dysregulation. Children's symptoms of impaired capacity for self-protection (sub-criterion C2) and maladaptive self-soothing (sub-criterion C3), habitual or reactive self-harm (sub-criterion C4), and inability to initiate or sustain goal-directed behavior (sub-criterion C5) did not show statistically significant differences in factor loadings, suggesting that the propensity to exhibiting these behaviours is a combination of attentional and behavioural dysregulation along with emotion dysregulation.

For the self and relational dysregulation factor, the factor loading for persistent extreme negative self-perception (sub-criterion D1) was the only criteria that showed a statistically significant decrease after accounting for the influence of emotion dysregulation. , showed decreases in their loadings on the specific factor after accounting for the effect of emotion

dysregulation, indicating that emotion dysregulation accounts for a significant proportion of children's propensity to exhibit these symptoms. Factor loadings for attachment insecurity and disorganization (sub-criterion D2), extreme persistent distrust, defiance, or lack of reciprocity in close relationships (sub-criterion D3), reactive physical or verbal aggression (sub-criterion D4), and psychological boundary deficits (sub-criterion D5) remained stable when comparing the two models, suggesting that the propensity to exhibiting these behaviours is a combination of self and relational dysregulation along with emotion dysregulation. The confidence intervals of the loadings for impaired capacity to regulate empathic arousal (sub-criterion D6) marginally overlapped; however, it appears that the loading got stronger for the specific factor after accounting for emotion dysregulation. This indicates that children's expression of callousness and a lack of empathy may be uniquely influenced by self and relational dysregulation rather than by emotion dysregulation or the balance of the two domains.

Comparing factor correlations in the correlated-factors model versus the bifactor_EMOTION DYSREGULATION model shows that the correlations between attentional and behavioural dysregulation and self and relational dysregulation are significantly and positively correlated across both models (r = .90, r = .84). This suggests that attentional and behavioural dysregulation and self and relational dysregulation are positively correlated in children who have experienced developmental trauma for reasons beyond having issues with emotion dysregulation and are approaching unity.

Table 16: Standardized Loadings for Correlated-Factors and Bifactor_EMOTION DYSREGULATION CFA Models

	ACC 0 Correlated Factors			ACC 0 Bifactor EMOTION DYSREGULATION		
Indicators	Emotion	Behav & Attention	Self & Relation	P (Emotion)	Behav & Attention	Self & Relation
Describes how he would kill himself	0.89 [0.82, 0.96]	-	-	0.89 [0.82, 0.96]	-	-
Distressed by traumatic memories	0.51 [0.41, 0.62]	-	-	0.52 [0.42, 0.62]	-	-
Extreme reaction to losing a friend, or being excluded by other children	0.56 [0.46, 0.66]	-	-	0.55 [0.45, 0.65]	-	-
Has panic attacks	0.38 [0.25, 0.51]	-	-	0.39 [0.26, 0.52]	-	-
Says his life is not worth living	0.90 [0.86, 0.94]	-	-	0.90 [0.86, 0.94]	-	-
Talks about suicide	0.94 [0.90, 0.97]	-	-	0.94 [0.90, 0.97]	-	-
Threatens to injure himself	0.92 [0.89, 0.95]	-	-	0.92 [0.89, 0.95]	-	-
Threatens to kill himself	0.97 [0.94, 0.99]	-	-	0.97 [0.94, 0.99]	-	-
Attention bias towards or away from threat	-	**0.56 [0.44, 0.69]**	-	0.44 [0.32, 0.56]	**0.29 [0.16, 0.41]**	-
Impaired self-protection	-	0.78 [0.68, 0.88]	-	0.39 [0.24, 0.52]	0.83 [0.66, 1.00]	-
Maladaptive self-soothing	-	0.46 [0.35, 0.57]	-	0.25 [0.12, 0.39]	0.41 [0.26, 0.55]	-
Non-suicidal self-injury	-	0.53 [0.43, 0.63]	-	0.38 [0.27, 0.49]	0.33 [0.20, 0.46]	-
Impaired ability to initiate or sustain goal-directed behaviour	-	0.66 [0.57, 0.75]	-	0.39 [0.29, 0.50]	0.52 [0.41, 0.63]	-
Self-loathing	-	-	**0.72 [0.64, 0.80]**	0.56 [0.48, 0.65]	-	**0.34 [0.23, 0.44]**
Attachment insecurity and disorganization	-	-	0.45 [0.35, 0.55]	0.31 [0.19, 0.42]	-	0.33 [0.21, 0.44]
Betrayal-based relational schemas	-	-	0.70 [0.59, 0.82]	0.35 [0.20, 0.50]	-	0.69 [0.56, 0.83]
Reactive verbal or physical aggression	-	-	0.51 [0.42, 0.60]	0.29 [0.17, 0.41]	-	0.44 [0.33, 0.55]
Impaired psychological boundaries	-	-	0.74 [0.59, 0.89]	0.48 [0.25, 0.70]	-	0.53 [0.33, 0.72]
Impaired interpersonal empathy	-	-	0.52 [0.43, 0.60]	0.14 [0.01, 0.26]	-	0.71 [0.60, 0.81]
Factor Correlations						
Behaviour & Attention	.61 [0.49, 0.73]					
Self & Relational	.61 [0.50, 0.73]	.90 [0.82, 0.99]			.84 [0.71, 0.96]	

In addition to examining differences in factor loadings between the correlated factors and bifactor$_{\text{EMOTION DYSREGULATION}}$ model, I calculated the proportion of variance in the indicators that is accounted for by the emotion dysregulation general factor (consistency) as well as the proportion of residual variance (specificity). Table 18 provides the consistency and specificity estimates for the baseline model. Overall, the proportion of variance in the symptoms accounted for by the general emotion dysregulation factor was small (range = 1% to 22%; M = 6.7%). The emotion dysregulation general factor accounted for the most amount of variance in symptoms related to "impaired self-protection" (criterion C2; 22%), "self-loathing" (criterion D1; 11%), and "impaired psychological boundaries" (criterion D5; 11%) and the least amount of variance in the "maladaptive self-soothing" (criterion C3; 2%), "attachment insecurity and disorganization" (criterion D2; 2%), and "impaired emotional empathy" (criterion D6; 1%).

Table 17: Bifactor_EMOTION DYSREGULATION Standardized Loadings and Consistency and Specificity Estimates

	ACC 0 Bifactor EMOTION DYSREGULATION				
Indicators	P (Emotion Dysregulation)	Behavioural & Attention Dysregulation	Self & Relational Dysregulation	CON	SPEC
Describes how he would kill himself	0.89	-	-	1	0
Distressed by traumatic memories	0.52	-	-	1	0
Extreme reaction to losing a friend, or being excluded by other children	0.55	-	-	1	0
Has panic attacks	0.39	-	-	1	0
Says his life is not worth living	0.90	-	-	1	0
Talks about suicide	0.94	-	-	1	0
Threatens to injure himself	0.92	-	-	1	0
Threatens to kill himself	0.97	-	-	1	0
Attention bias towards or away from threat	0.44	0.29	-	0.06	0.94
Impaired self-protection	0.39	0.83	-	0.22	0.78
Maladaptive self-soothing	0.25	0.41	-	0.02	0.98
Non-suicidal self-injury	0.38	0.33	-	0.04	0.96
Impaired ability to initiate or sustain goal-directed behaviour	0.39	0.52	-	0.06	0.94
Self-loathing	0.56	-	0.34	0.11	0.89
Attachment insecurity and disorganization	0.31	-	0.33	0.02	0.98
Betrayal-based relational schemas	0.35	-	0.69	0.05	0.95
Reactive verbal or physical aggression	0.29	-	0.44	0.04	0.96
Impaired psychological boundaries	0.48	-	0.53	0.11	0.89
Impaired interpersonal empathy	0.14	-	0.71	0.01	0.99
Factor Correlations					
Behaviour & Attention					
Self & Relational		0.84			

CON = Consistency. SPEC = Specificity.

Discussion

I sought to address two main objectives in the present thesis. First, I assessed the applicability of the Assessment Checklist for Children for the measurement of DTD symptomatology based on the proposed DTD diagnostic criteria. Second, I examined the factor structure of DTD symptoms in children what have experienced maltreatment, with a particular focus on testing emotion dysregulation as a general factor of psychopathology.

Measurement of Developmental Trauma Disorder Symptomatology

Building on Denton et al.'s (2017) review of trauma measures, I predicted that the existing ACC scales would be appropriate proxies for DTD symptomatology. The results partially support Denton et al.'s conclusion that the ACC is the most appropriate measure for assessing developmental trauma symptoms. While the ACC covered a large proportion of the DTD framework, the finding that the ACC scales did not neatly fit within the DTD criteria indicates that the existing ACC scales are not interpretable from within a DTD framework. Consequently, I recoded the ACC items to develop scales based on the symptoms captured by criteria B, C, and D of the proposed DTD framework. Based on this recoding of the ACC items, I determined that the items of the ACC capture a broad set of the DTD symptoms but that there are gaps related to several the DTD symptoms. For example, there are limited items that assess impaired recovery from extreme negative affect states (sub-criterion B1b), aversion to touch (sub-criterion B2a), aversion to sounds (sub-criterion B2b), somatic distress/illness that cannot medically be explained or resolved (sub-criterion B2c), absence of emotion (sub-criterion B3a), physical anesthesia that cannot medically be explained or resolved (sub-criterion B3b), alexithymia (sub-criterion B4a), and impaired ability to recognize or express somatic feelings or states (sub-criterion B4b), extreme risk-taking, thrill-seeking or recklessness (sub-criterion C2a),

parentified over-protection of caregivers (sub-criterion D2a), difficulty tolerating reunion after separation from primary caregivers (sub-criterion D2b), and reactive physical or verbal aggression (sub-criterion D4). Given these gaps, the factor analytic work for the second objective of the current study was unable to model the full breadth of symptoms captured by the DTD criteria.

The lack of items related to attachment disorganization is particularly surprising, given that one of the reasons Tarren-Sweeney (2014) developed the ACC was the lack of attachment-related problems covered by traditional measures of child and adolescent symptoms, such as the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), Rutter's Behaviour Scale for children (Elander & Rutter, 1996), and the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001). With that said, it is worth noting that some of the behaviours captured by the ACC items may be downstream manifestations of attachment disorganization, even if the items were not directly codable according to the DTD criterion for attachment disorganization. For example, items that capture indiscriminate friendliness and craving proximity along with non-reciprocating and rejecting behaviours were coded into other DTD criteria because they aligned more closely with the operational definitions of those criteria more than those used for disorganized attachment, which were specific to "parentified over-protection of caregivers" and "difficulty tolerating reunion after separation from primary caregivers" (Ford et al., 2019).

Through recoding the ACC, I also uncovered items that extend beyond the scope of the DTD criteria. Extraneous symptoms included those related to pseudomature interpersonal behaviours, suicide attempts, and dissociation. This finding is interesting given that DTD was proposed as a unifying disorder to capture the breadth of symptoms experienced by children who have experienced early childhood maltreatment and attachment disruption.

Structure of DTD Symptomatology

Second, I sought to explore the structure of psychopathology in a clinically complex sample of children who have experienced maltreatment. Specifically, I sought to address what factorial structure could best explain the variance of developmental trauma symptoms expressed by these children. The models tested in the present research differ from much of the previous factor analytic research of psychopathology. Instead of using internalizing, externalizing, and thought disorders as the first order latent factors, as has traditionally been done (e.g., Caspi et al., 2014; Lahey et al., 2017), I used the proposed DTD criteria—namely, affect and somatic dysregulation (criterion B), attention and behavioural dysregulation (criterion C), and self and relational dysregulation (criterion D)—as the specific factors. As a result, in addition to testing for the influence of a general liability to developmental trauma symptoms, the present research tests the proposed factor structure of the DTD criteria. I tested various models to determine the influence of (1) a non-specific general domain, (2) emotion dysregulation as a reference for a general domain, and (3) specific domains of dysregulation on the expression of specific DTD symptoms. I hypothesized that all models would fit the data well but that the bifactor(s-1) model, with the *p*-factor defined as emotion dysregulation, would be the best-fitting model. I also hypothesized that the *p*-factor (general emotion dysregulation) would account for much of the variance in children's symptoms.

Due to anomalous results (negative, non-significant, or small factor loadings), I could not interpret the symmetrical bifactor model. Such results are consistent with a large proportion of studies that have tested a fully symmetrical bifactor model to explain psychopathology data (Eid et al., 2017; Heinrich et al., 2020a, 2020b). Many published studies have either chosen to ignore the negative and non-significant factor loadings or have opted to drop the problematic specific

factors so that the indicators for the dropped factor then load exclusively on the general psychopathology factor. In the latter case, most authors have continued to inaccurately interpret the general psychopathology factor as general liability to all mental disorders due to some undefined and unmeasured factors. However, Eid et al. (2017) and Heinrich et al. (2020b) explain, both conceptually and statistically, that dropping a specific factor (or one or more indicators from one or more specific factor) while retaining their loadings on the general factor results in the dropped factor/indicator(s) becoming the reference domain by which the general factor is then defined. Rather than examining the bifactor(s-1) factor by dropping the anomalous results of the symmetrical bifactor, as has been customary, I selected emotion dysregulation as the general reference domain based on the grounds that emotion dysregulation is a transdiagnostic potentiator of psychopathology (McLaughlin et al., 2020; Beauchaine & Cicchetti, 2019).

The bifactor$_{\text{EMOTION DYSREGUALTION}}$ model overcame the model specification problems of the fully symmetrical bifactor model. In this model, the emotion dysregulation symptoms defined the general reference factor. Such a measurement model enabled me to assess the degree to which children's liability to the other DTD symptoms is accounted for by emotion dysregulation. This model made sense to test, theoretically, given that emotion dysregulation has been established as a transdiagnostic risk factor for the development of psychopathology (Beauchaine & Cicchetti, 2019) and as being one of the central mediating mechanisms linking childhood maltreatment to a broad array of physical and psychosocial sequelae. I hypothesized that the emotion dysregulation general reference factor would account for much of the variance in children's DTD symptoms, thereby rendering the behavioural and attentional dysregulation and self and relational dysregulation specific factors to be less important in explaining the expression

of children's symptoms. The results did not support this hypothesis, given that the proportion of variance in the symptoms accounted for by the general emotion dysregulation factor was small, ranging from 1% to 22% and a mean of 6.7%. Nevertheless, the results do indicate that emotion dysregulation is an important factor for several symptoms, including impaired self-protection (criterion C2; 22%), self-loathing (criterion D1; 11%), and impaired psychological boundaries (criterion D5; 11%). While this lack of consistency in the effect of the general factor on the indicators would be problematic in a symmetrical bifactor model, the size of factor loadings of non-reference domain indicators can vary in the bifactor(s-1) model (Heinrich et al., 2020b; Watts, 2019).

The two indicators that saw statistically significant reductions in the proportion of variance accounted for by the specific factor when comparing the correlated factors and bifactor(s-1) models were *attention bias toward or away from potential threats* (standardized loading: correlated factors model = .56, bifactor$_{\text{EMOTION DYSREGULATION}}$ model = .29) and *persistent extreme negative self-perceptions* (standardized loading: correlated factors model = .72, bifactor$_{\text{EMOTION DYSREGULATION}}$ model = .34). However, it is worth noting that several other symptoms appeared to show reductions; however, the confidence intervals for the factor loadings were large. Thus, it is possible that the present study did not have adequate power to calculate meaningful differences between the models for all the indicators, given the complexity of the models tested.

It is notable that the correlation between the specific factors remained high between the correlated three factor model and the bifactor(s-1) model (T1 r: correlated factors model = .90, bifactor$_{\text{EMOTION DYSREGULATION}}$ model = .84). Because this represents a partial correlation (i.e., the strength of association between the specific factors after partialling out the common effect of

the reference domain; Eid et al., 2017), it indicates that the behaviour and attention dysregulation and self and relational dysregulation factors share a substantial proportion of variance over-and-above the 40% of the shared variance explained by the emotion dysregulation reference factor. This means that children who experience more (or less) behaviour and attention dysregulation than would be expected based on their emotion dysregulation scores also tend to experience more (or less) self and relational dysregulation than would be expected based on their level of emotional dysregulation.

One explanation that may account for the strong correlation between the specific factors after accounting for emotion dysregulation is that the emotion dysregulation reference factor was comprised of symptoms that indicate "extreme and intolerable negative affect states" and "impaired recovery from extreme negative affect states" (DTD sub-criterion B1; Ford et al., 2019). Thus, it may not adequately capture the full extent of emotion regulation difficulties assessed by validated measures of emotion (dys)regulation, such as the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1998) and the Difficulties in Emotion Regulation Scale – 16 item (DERS-16; Bjureberg et al., 2016). For example, the ACC does not explicitly capture proneness to angry outbursts or the tendency to have wide mood swings, which are items captured by the Lability/Negativity subscale of the ERC, nor does it represent subscales from the DERS-16 such as *lack of emotional clarity*, *difficulties engaging in goal-directed behaviour*, *impulse control difficulties*, *limited access to effective emotion regulation strategies*, and *nonacceptance of emotional responses*. This is important to note because many of the items and sub-criteria across all three DTD criteria overlap with various items and scales that comprise these validated scales of emotion dysregulation. It suggests that to adequately test the full influence of emotion dysregulation as a general factor, it would necessitate a measurement

structure that does not adhere to the organization of the DTD diagnostic criteria.

Relatedly, another potential explanation for the limited explanatory power of the emotion dysregulation general factor is the nature of the items that define the factor. There are a disproportionate number of items that relate to suicidality, and specifically, suicide and self-harm discourse and threats. At face value, these behaviours certainly do indicate a high level of emotional dysregulation. However, it is not entirely clear whether these behaviours truly represent children experiencing extreme and intolerable emotions, as well as their inability to recover from negative affective states, or whether these behaviours are more instrumental in nature, focused on eliciting a response from their (new) caregiver(s). Realistically, these items would capture both scenarios and thus, it may be worth attempting to disambiguate these items with more contextual information in the future. However, if the suicide discourse items disproportionately captured instrumental behaviours, one would expect the emotion dysregulation factor to explain more variance in the interpersonal dysregulation indicators, including *reactive verbal or physical aggression* and *impaired interpersonal empathy*. Because this is not the case (in fact, the general factor loadings for these indicators were relatively small), it is likely that the suicide discourse items are appropriate indicators of emotion dysregulation.

Alternately, given that the suicide and self-harm related items represent particularly severe emotional dysregulation, it is possible that the factor has a scaling problem, in that the general factor may not be picking up meaningful variance in the items that characterize less severe and more common expressions of emotional dysregulation. Thus, it is possible that the reference domain may represent suicide discourse rather than emotion dysregulation. This is a plausible conclusion given that the suicide discourse items have extremely high factor loadings (ranging from .89 to .97), and the non-suicide items have comparatively small factor loadings

(ranging from .39 to .55). Given this discrepancy, it may be worth parcelling the suicide discourse items into one or two indicators to ensure there is a more balanced distribution of indicators to define the emotion dysregulation factor in future research.

Finally, it is possible that an alternate mechanism may explain the variance in children's symptoms more robustly than emotion dysregulation. For example, previous research has also identified social information processing, and specifically, the attentional bias toward threat, as a central mediator linking maltreatment with the development of psychopathology (McLaughlin et al., 2020). Thus, it may be worth testing multiple bifactor(s-1) or bifactor(s1-1) models (i.e., a model in which a single indicator defines the general reference domain) to compare the explanatory power of several candidate mechanisms. It is, however, worth noting that psychopathology does not have a single cause (i.e., equifinality; Cicchetti & Rogosch, 1996). Thus, I did not expect the emotion dysregulation reference factor to account for all the variance in children's symptoms. Instead, I used the bifactor(s-1) model to support the efforts to enable the research examining the effects of specific transdiagnostic mechanisms on mental disorders to be meaningfully compared in the future (Heinrich, 2020b).

Clinical Implications

Both parts of the present study have important clinical implications related to the assessment of children who have experienced complex developmental trauma and for treatment planning.

Assessment of Developmental Trauma Symptomatology

It is increasingly recognized that measurement should be a central aspect of treatment implementation and monitoring. The use of measurement-based care has been found to improve treatment at the clinical and organizational levels. Clinically, measurement-based care has been

found to enhance therapeutic alliance and inform case conceptualization while supporting quality improvement efforts in organizations (Jensen-Doss et al., 2020). With that said, measurement *per se* is insufficient; the quality and appropriateness of measures are critical to consider. Several factors determine the quality and validity of a measurement tool: the measurement of symptoms should be guided by an evidence-based and theoretically sound framework, which can facilitate clinical interpretation. With increasing acceptance and endorsement of the developmental trauma framework among clinicians across disciplines, it is important that the tools to assess developmental trauma symptomatology can provide fulsome insight into the wide array of symptoms exhibited by children with histories of maltreatment. However, based on the results of the present study, the ACC as a stand-alone measure does not seem to be a tenable option for assessing developmental trauma symptomatology. As discussed above, the ACC does not adequately capture all the DTD diagnostic criteria. Further, the ACC does not capture traditional PTSD symptoms or children's trauma exposure.

Treatment Considerations

The second part of the study contributed to the growing evidence that developmental trauma is a valid construct for capturing the symptoms of psychosocial dysfunction among children who have experienced complex childhood trauma. As we come to better understand the symptom profiles in children who have experienced developmental trauma, we can refine our measures and, based on explicit frameworks, test hypotheses to inform case conceptualization and improve treatment selection and outcomes (Ford, 2021; Ford et al., 2013; Jensen-Doss et al., 2020; Stolbach et al., 2013).

While the results do not suggest that emotion dysregulation singularly explains children's symptoms, the results do support the need to prioritize treatments that emphasize the co-

regulation of emotions and the development of emotion regulation skills and strategies. Given the importance of the child-caregiver attachment relationship in the development of emotion regulation abilities, a multilevel approach to treatment for children and youth who have been maltreated may prove to be most efficacious (Zeanah, 2019). From an individual level, trauma-focused cognitive behaviour therapy (TF-CBT) has a large evidence-base for treating children with predominantly PTSD and who have experienced trauma such as sexual or physical abuse and war trauma. For example, two meta-analyses have found that TF-CBT with or without exposure therapy was superior to treatment as usual or credible alternative therapies in reducing PTSD symptoms with medium to large effect sizes, though effect sizes for depression and anxiety symptoms were small to medium, and follow-up measures 3 to 6 months post-treatment found CBT to have only marginally better sustainability of treatment effects for PTSD symptoms (Ford, 2021; Gutermann et al., 2016; 2017). However, no meta-analyses or systematic reviews of intervention outcomes with children and adolescents within a DTD framework have been reported.

Additionally, Dialectical Behaviour Therapy (DBT; Linehan, 1993) may be a well-suited treatment approach for working with children and youth who have experienced developmental trauma. DBT was originally developed for the treatment of adults with borderline personality disorder but has since been expanded as an effective transdiagnostic treatment for other common mental health disorders and developmentally appropriate adaptations have made it applicable to children and youth (Linehan & Wilks, 2015; Ritschel et al., 2015). While no studies to date have examined the effectiveness of a child- and youth-specific version of DBT for developmental trauma, the treatment targets (i.e., supporting emotion regulation, interpersonal effectiveness, distress tolerance, and mindfulness) appear to be highly relevant to the scope of dysregulation

captured by the DTD diagnostic framework. Indeed, developmental trauma has been long considered an important antecedent of BPD given the disruptions to emotion regulation and interpersonal functioning (especially related to attachment), which are characteristic of the BPD (Herman, 1992a, 1992b). Given the focus on developing emotion regulation skills, some clinicians argue that DBT may be an appropriate starting place in a multimodal treatment plan prior to engaging in exposure exercises (during trauma-focused CBT) to prevent dissociation, which would thereby render the exposure to be ineffective due to the preclusion of new learning (Bohus, 2021; Choi-Kain et al., 2021). This has been found to be particularly helpful—and superior to CBT alone—in a Randomized Clinical Trial with female adult outpatient clients with child abuse-associated complex PTSD (Bohus et al., 2020), though data with young people have not yet been published.

The present study also supports the need for relational therapeutic approaches. Evidence-based relational treatments, such as Child-Parent Psychotherapy (CPP; Lieberman et al., 2015) and Attachment and Biobehavioral Catch-Up (ABC; Dozier & Bernard, 2019), focus on supporting the child-caregiver attachment relationship, which may support sustainable healing and change. Beyond ensuring that children's basic needs are met and that they are no longer in danger, the family system and parent-child relationships have a high degree of influence on children's emotion regulation skills through behavioural modelling and scaffolding (or a lack thereof) as well as potential exposure to upstream stressors that get filtered down to the child (Browne et al., 2015). Supporting families with the skills and capacities to co-regulate and teach emotion regulation skills *in vivo* may help children to develop not only the language and skills for emotion regulation but also strengthen the connections between their prefrontal cortex and their limbic system, thereby increasing their neurobiological capacity to control their emotions

(Kerr et al., 2019, 2020). Accordingly, Beauchaine and Cicchetti (2019) state that "…altering complex transactions through which endogenous vulnerabilities transact with social dynamics to reinforce emotion dysregulation and canalize its neuroplastic substrates is of utmost importance to those who seek to prevent and treat various forms of mental illness" (p. 799). Additionally, given the use-dependent (i.e., dose-response) nature of brain development (Perry, 2009), it is possible to improve emotion regulation across development in children who have experienced maltreatment in part through more efficient top-down modulation and improved connectivity between subcortical structures and the PFC (Beauchaine & Cicchetti, 2019).

Limitations and Future Directions

The present study has several strengths: the application and explicit testing of the ACC within a developmental trauma framework, the use of a theoretically informed approach to testing the structure of developmental trauma symptoms, and the inclusion of a large sample of children and youth with substantiated cases of maltreatment. Nevertheless, there are several limitations to highlight. First, the data available for the present study were limited to the ACC and basic demographics (age, gender, and care type), which were collected as part of the standard quality assurance and procedures at TFCP over the last 20 years. Thus, several key covariates were unavailable, which would be important for producing more clinically relevant results. For example, information about the chronicity and types of traumata to which children have been exposed would help clarify children's liability to the various symptoms. Additionally, the accumulation of social and environmental risks, as well as traumatic events, can increase the complexity and severity of symptom presentations (Evans et al., 2013; Finkelhor et al., 2007). Thus, the inclusion of more information pertaining to children's demographics and histories is an important consideration for future extensions of the present analyses.

Additionally, because 42 of the 326 (12.88%) children with two assessments were assessed by different caregivers, it is possible that inconsistencies in reporters and their response-styles (i.e., bias) may influence the results. However, given that there were no systematic differences found between the models across assessments (i.e., strong longitudinal measurement invariance was achieved), it is unlikely that these changes in caregivers posed a significant threat to the present study's internal validity. Further, most of the change in reporters was due to placement changes, a relatively common phenomena to be expected in child welfare samples. Some estimates indicate that approximately 25% to 50% of children in child welfare experience more than two placements, 10% to 15% experience several placement changes, and that placement changes are related to children's psychosocial difficulties (Aarons et al., 2010). Nevertheless, follow up studies should include a sensitivity analyses to determine whether the results significantly change when children with multiple caregivers/reporters are excluded from the analysis. However, such a sensitivity analysis may not be able to adequately disentangle whether differences are due to the change in caregivers or whether differences are a product of the children's functioning. To address this limitation, future research should incorporate multi-informant assessments, including clinician assessments, to increase the likelihood that there will be consistency in some of the raters completing measures at multiple time points.

Additionally, as highlighted above, the ACC did not capture all the DTD symptomatology, thereby precluding the modelling of several DTD symptoms and limiting the present study's ability to comprehensively address the research questions. The most notable gap relates to somatic symptoms and concerns related to disorganized and insecure attachment. Second, the emotion dysregulation items used for the bifactor(s-1) model did not come from a validated measure of emotion dysregulation but was constructed from an ad hoc selection of

items from various existing ACC scales. Further studies to assess the convergent validity of the DTD criteria subscales using the ACC items are required to determine the degree to which the factors used in the present study accurately reflect their intended constructs.

Conclusion

In this study, I examined the factorial structure of DTD symptoms using the Assessment Checklist for Children in a sample of children involved in the child welfare system and receiving therapeutic services from the Therapeutic Family Care Program in Cobourg, Ontario. This research helps to clarify the nature and children's symptoms who have experienced complex trauma and the degree to which emotion dysregulation is a transdiagnostic mechanism that influences the expression of other DTD symptoms. This research provides further support for the utility of DTD as a means of capturing the diversity of children's symptoms and as a disorder. As our understanding of the causes and consequences of developmental trauma evolves, we become better equipped to respond. We can refine our assessments, classifications, and treatments and achieve better outcomes. The present research focused on the former two of these three components of clinical research and practice and contributes to the ongoing global efforts by researchers, practitioners, and policymakers to accurately represent and address the needs of the many children, youth, and adults who are so often misdiagnosed and failed by the systems designed to support them.

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Appendices

Appendix A: ACC Scale Reliabilities

Table 18. Internal Reliability Coefficients for the Assessment Checklist for Children (ACC) Scales

ACC Scales	Cronbach's α [95% CI]
Total Clinical Score	**.92 [.91, .93]**
Suicide Discourse	.85 [.84, .87]
Insecure Interpersonal Behaviour	.80 [.77, .83]
Non-Reciprocal Interpersonal Behaviour	.79 [.76, .82]
Pseudomature Interpersonal Behaviour	.77 [.74, .81]
Sexual	.72 [.69, .76]
Self-Injury Total	.73 [.69, .76]
Indiscriminate Interpersonal Behaviour	.71 [.67, .75]
Anxious-Distrustful	.70 [.66, .74]
Food Maintenance	.70 [.65, .75]
Abnormal Pain Response	.56 [.50, .63]
Other Items	.56 [.50, .62]
Composite Self-Esteem	**.89 [.87, .90]**
Negative Self Image	.89 [.88, .91]
Low Confidence	.76 [.73, .80]

Appendix B: CFA Model Fit Statistics

Table 19: Fit Statistics & Longitudinal Measurement Invariance – Hybrid CFA Models

Models	N Pars	χ^2	df	CFI	RMSEA	RMSEA 95% CI	SRMR
1Factor							
T0	57	694.812	152	.912	.080	[.074, .086]	.162
T1	57	725.208	152	.878	.108	[.100, .116]	.202
Configural	147	1663.014	798	.894	.044	[.041, .047]	.156
Threshold	147	1663.014	798	.894	.044	[.041, .047]	.156
Metric	128	1675.336	817	.895	.044	[.041, .047]	.155
Scalar	109	1686.991	836	.896	.043	[.040, .046]	.155
Strict	**89**	**1707.31**	**856**	**.896**	**.042**	**[.039, .045]**	**.156**
3 Factor							
T0	60	507.128	149	.942	.066	[.060, .072]	.121
T1	60	508.915	149	.923	.086	[.078, .094]	.153
Configural	148	1164.472	631	.936	.039	[.036, .043]	.126
Threshold	148	1164.471	631	.936	.039	[.036, .043]	.126
Metric	132	1172.639	647	.937	.038	[.035, .042]	.126
Scalar	116	1186.169	663	.937	.038	[.034, .041]	.126
Strict	**97**	**1203.132**	**682**	**.937**	**.037**	**[.034, .041]**	**.127**
Second Order							
T0	60	507.128	149	.942	.066	[.060, .072]	.121
T1	NA	NA	NA	NA	NA	NA	NA
** Measurement Invariance Not Tested Due to Errors with Separate Models*							
Bifactor *SYMMETRICAL*							
T0	76	301.769	133	.973	.048	[.041, .055]	.086
T1	76	244.804	133	.976	.051	[.041, .061]	.107
** Measurement Invariance Not Tested Due to Errors with Separate Models*							
Bifactor(s-1) *EMOTION DYSREGULATION*							
T0	69	472.904	140	.946	.066	[.059, .072]	.112
T1	69	463.236	140	.931	.084	[.076, .093]	.143
Configural	160	1076.441	619	.945	.037	[.033, .040]	.124
Threshold	160	1076.441	619	.945	.037	[.033, .040]	.124
Metric	133	1087.297	646	.947	.035	[.031, .039]	.123
Scalar	117	1099.369	662	.948	.035	[.031, .038]	.124
Strict	**98**	**1115.409**	**681**	**.948**	**.034**	**[.030, .037]**	**.125**

Appendix C: CFA Model Figures

Figure 9: Hybrid 1 Factor Model with Standardized Factor Loadings

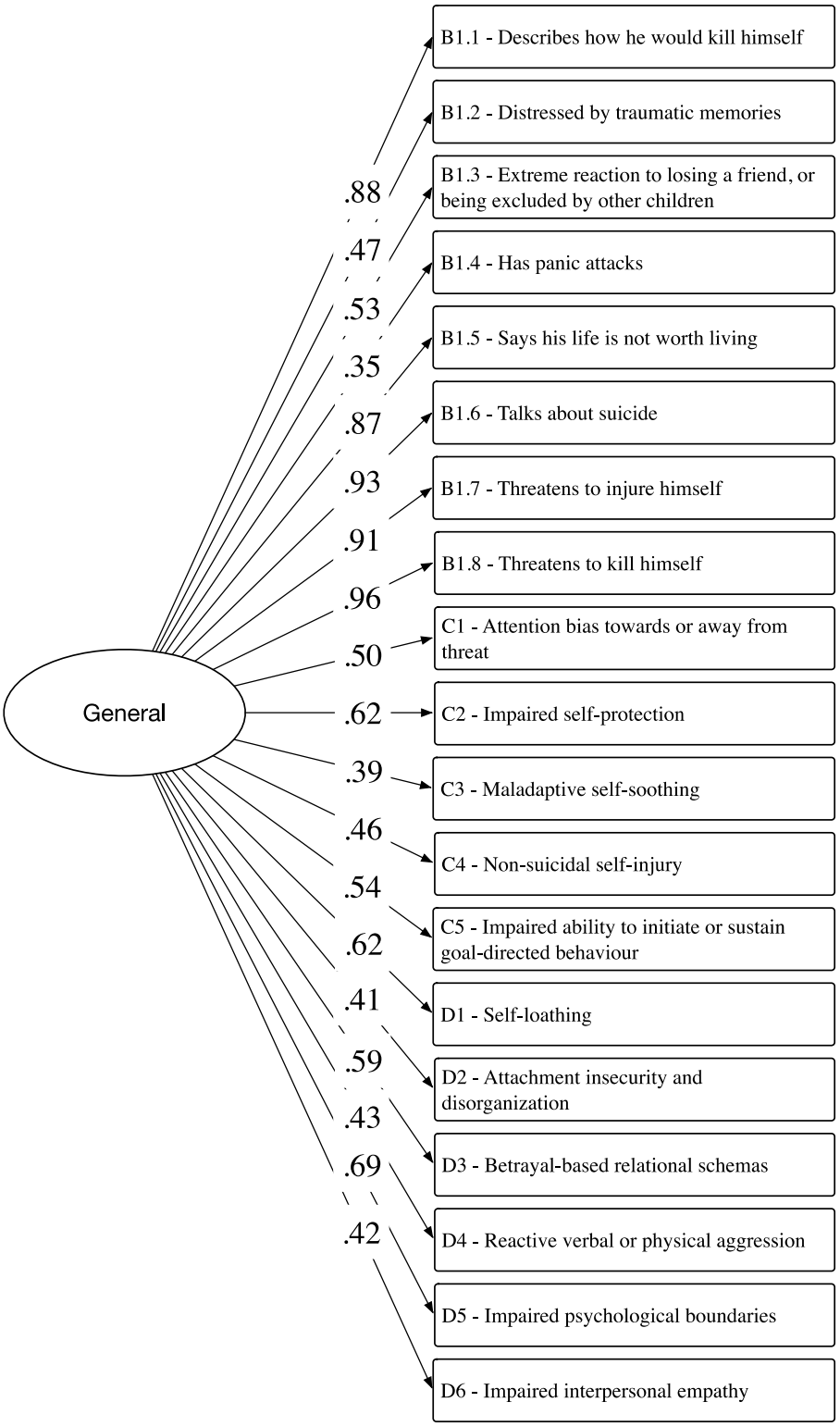


Figure 10: Hybrid Correlated Factors Model with Standardized Factor Loadings

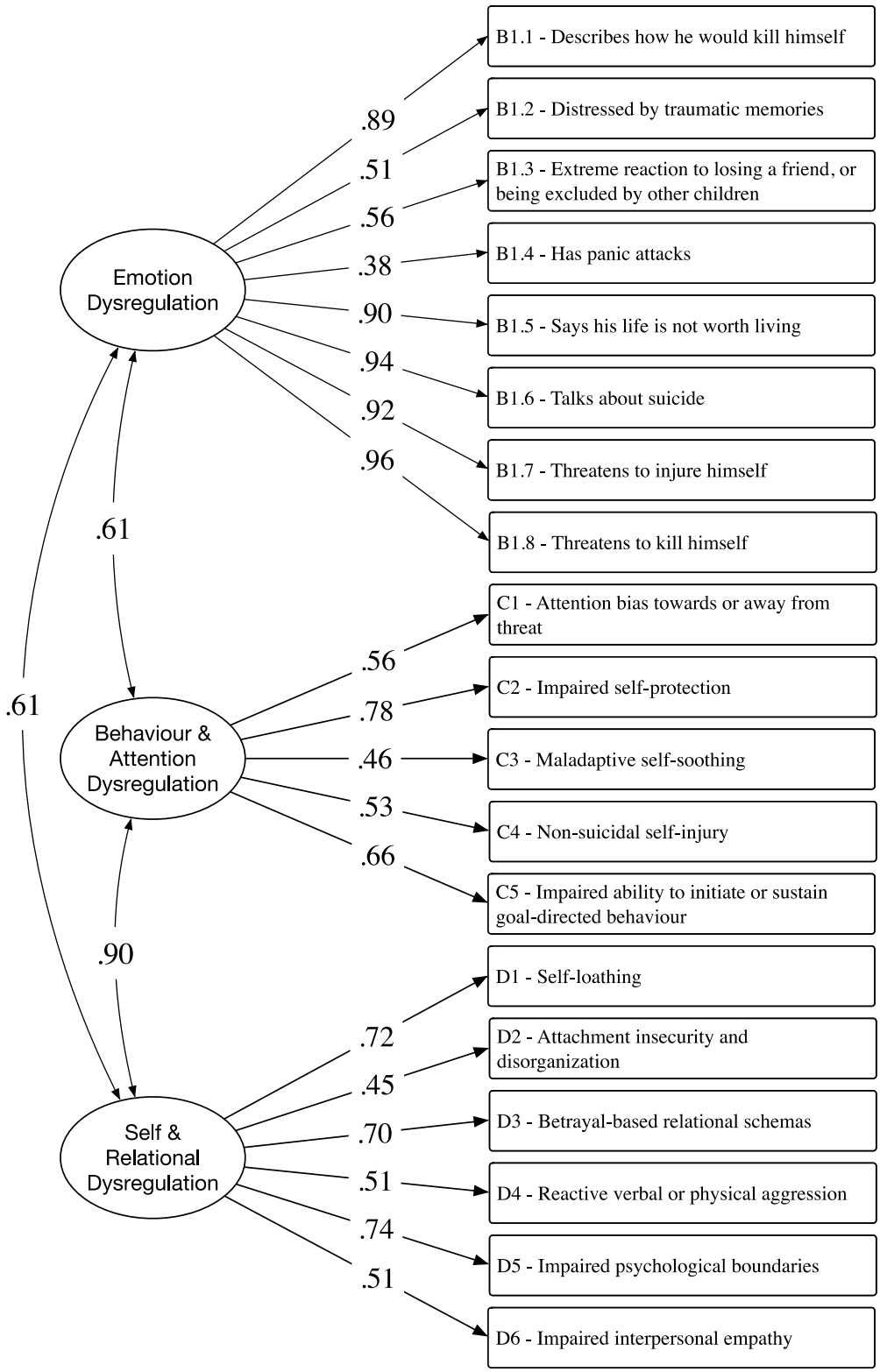


Figure 11: Hybrid Second Order Model with Standardized Factor Loadings

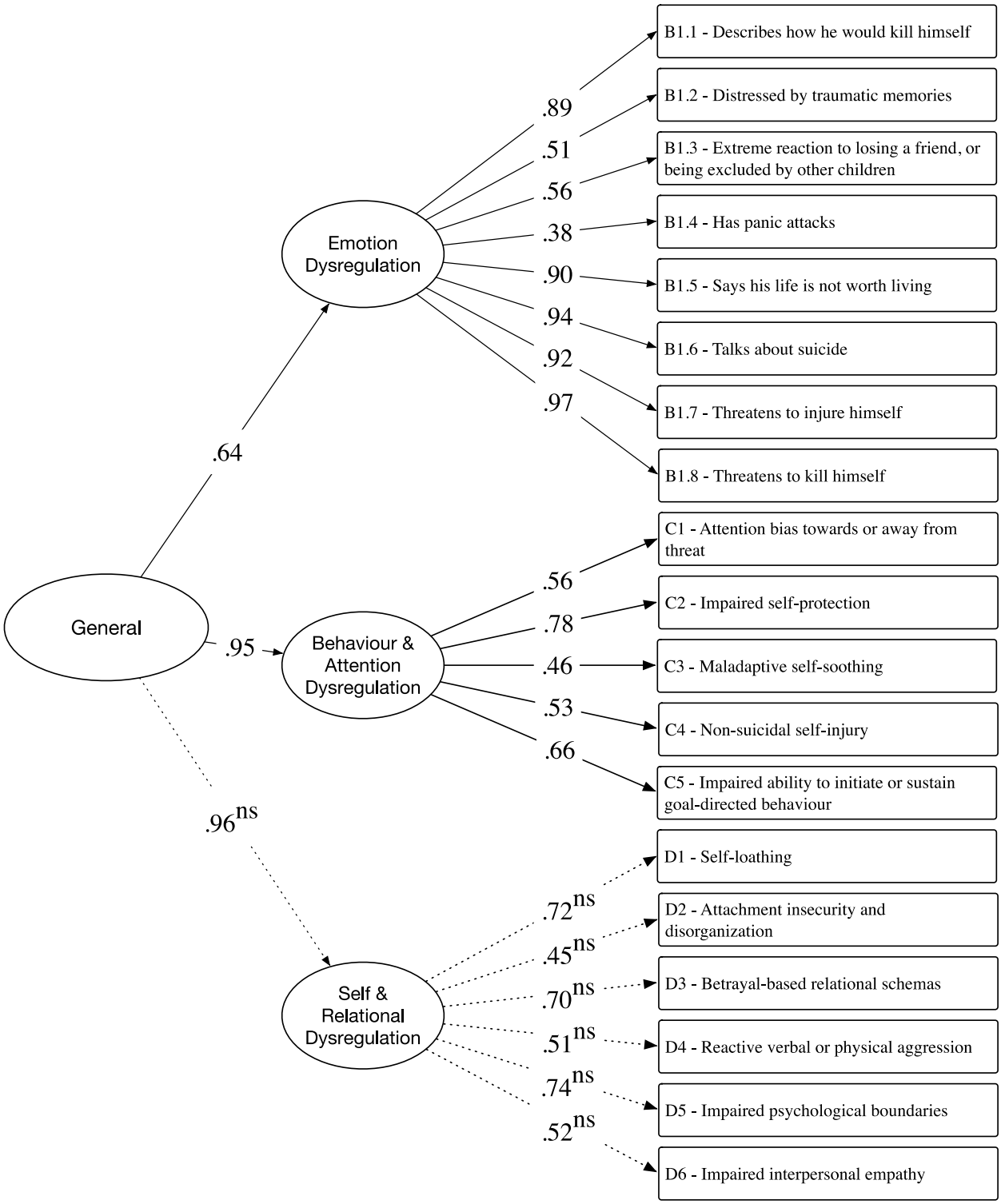


Figure 12: Hybrid Symmetrical Bifactor Model with Standardized Factor Loadings

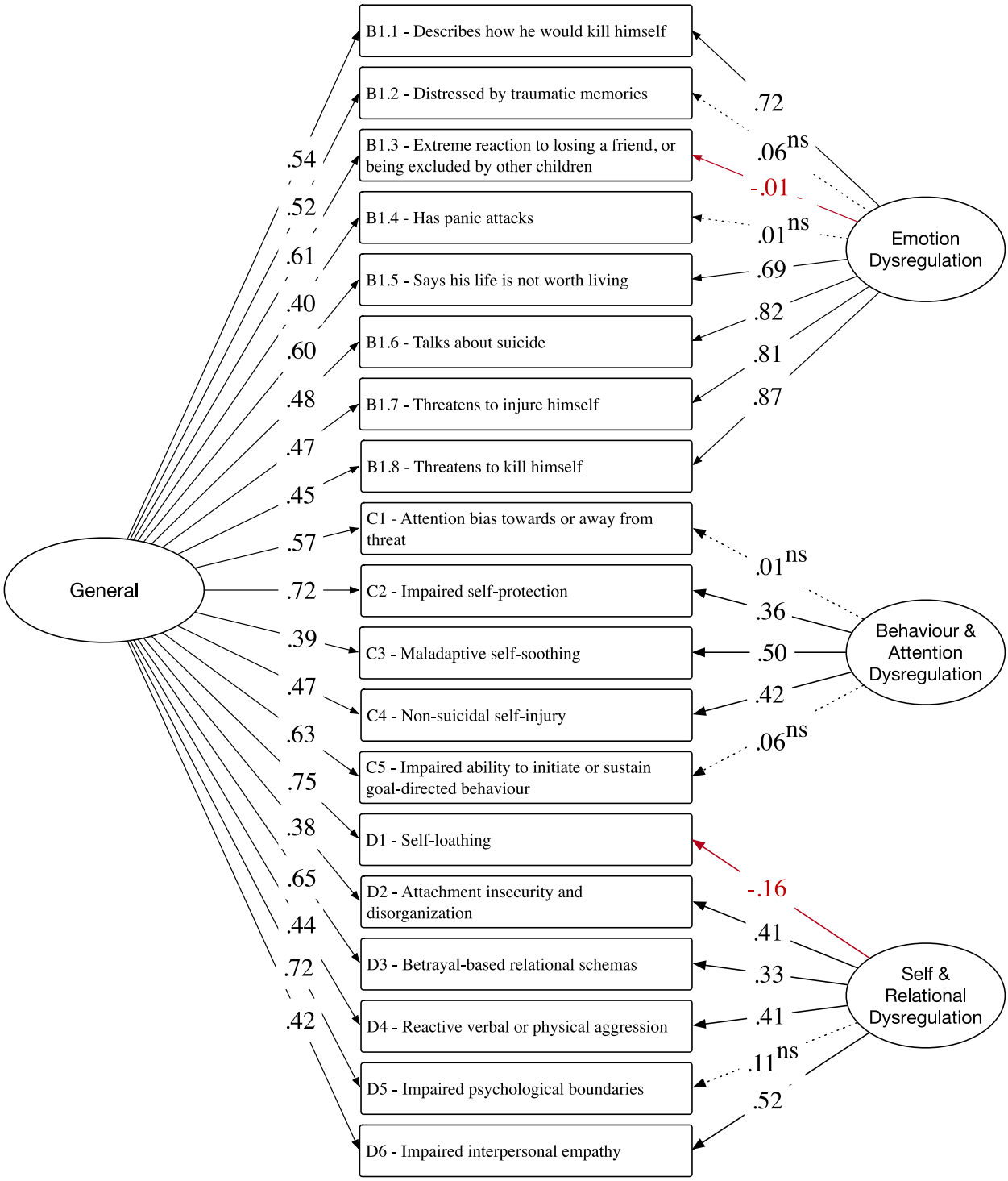
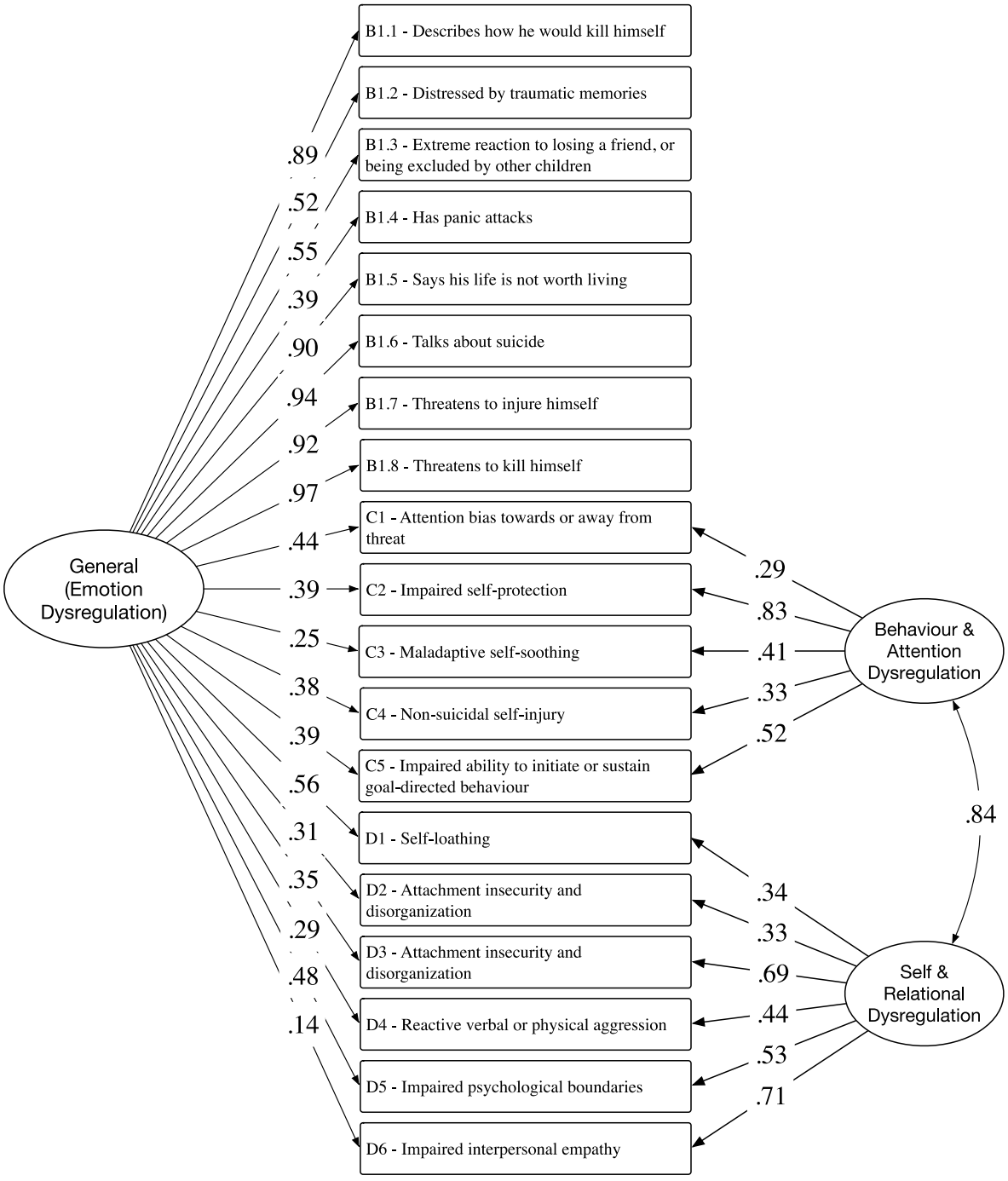


Figure 13: Hybrid Bifactor_EMOTION DYSREGULATION Model with Standardized Factor Loadings



Appendix D: ACC Items Assigned to DTD Criteria

Table 20: ACC Items Assigned to DTD Criteria

Item #	ACC ITEMS	Original ACC Scale
B1: Emotion dysregulation (either B1.a. extreme and intolerable negative affect states; or B1b. impaired recovery from extreme negative affect states)		
89	Describes how he would kill himself	Suicide Discourse
91	Distressed by traumatic memories	Anxious-Distrustful
93	Extreme reaction to losing a friend, or being excluded by other children	Insecure Interpersonal Behaviour
97	Has panic attacks	Anxious-Distrustful
107	Says his life is not worth living	Suicide Discourse
113	Talks about suicide	Suicide Discourse
114	Threatens to injure himself	Suicide Discourse
115	Threatens to kill himself	Suicide Discourse
B3: Impaired awareness or dissociation of emotions or body (either B3a. absence of emotion; or B3b. physical anaesthesia that cannot medically be explained or resolved)		
12	Does not cry	Abnormal Pain Response
92	Does not show pain if physically hurt	Abnormal Pain Response
96	Has blackouts or periods of amnesia	Other Items
C1: Attention bias towards or away from threat (either C1.a. threat-related rumination; or C1.b. hyper- or hypo-vigilance to actual or potential danger)		
23	Fearful or nervous at bedtime	Anxious-Distrustful
24	Fears he might be molested	Anxious-Distrustful
35	Has nightmares	Anxious-Distrustful
37	Hides or stores food	Food Maintenance
40	Is fearful of being harmed	Anxious-Distrustful
60	Startles easily	Insecure Interpersonal Behaviour
65	Too compliant (over-conforms)	Insecure Interpersonal Behaviour
77	Wary or vigilant	Anxious-Distrustful
81	Worries that something bad will happen to you	Insecure Interpersonal Behaviour
C2: Impaired self-protection (either C2.a. extreme risk-taking or recklessness; or C2.b. intentional provocation of conflict or violence)		
2	Attention-seeking behaviour	Indiscriminate Interpersonal Behaviour
30	Gets hurt a lot, “accident prone”	Other Items
47	Play includes violent or frightening themes	Non-reciprocal Interpersonal Behaviour
55	Risks physical safety, fearless	Other Items
73	Turns friends against each other	Pseudomature Interpersonal Behaviour
82	Asks to be physically punished	Self-Injury Total

105	Requests to be harmed	Suicide Discourse
119	Unhealthy drinking (e.g., from discarded drink bottle, from toilet bowl)	Self-Injury Total

C3: Maladaptive self-soothing

21	Eats too much	Food Maintenance
32	Gorges food	Food Maintenance
43	Laughs when injured or hurt	Abnormal Pain Response
76	Wants to be treated like a baby, or a toddler	Anxious-Distrustful
85	Causes himself to vomit	Self-Injury Total
87	Cuts or pulls out his hair	Self-Injury Total
88	Cuts or rips his clothes	self-Injury Total
106	Rocks back and forth	Self-Injury Total

C4: Habitual (intentional or automatic) or reactive self-harm (non-suicidal self-injury)

19	Eats from garbage	Self-Injury Total
20	Eats things that are not food	Self-Injury Total
84	Bites himself	Self-Injury Total
86	Causes injury to himself	Self-Injury Total
98	Hits head, head-banging	Self-Injury Total
99	Intentionally harms himself with knives or implements	Self-Injury Total
100	Intentionally swallows dangerous substance to harm himself (e.g., medication, poison)	Self-Injury Total
104	Picks at sores or injuries	Other Items
116	Throws himself against walls, onto floors, etc.	Self-Injury Total

C5: Impaired ability to initiate or sustain goal-directed behaviour

1	Adjusts slowly to changes	Low Confidence
5	Can't concentrate, short attention span	Other Items
15	Does not speak up for himself	Low Confidence
16	Easily discouraged at home	Low Confidence
17	Easily discouraged at school	Low Confidence
18	Easily influenced by other children	Indiscriminate Interpersonal Behaviour
29	Finds it hard to make decisions	Low Confidence
31	Gives up too easily	Low Confidence
75	Very forgetful	Other Items
79	Won't attempt new activities	Low Confidence

D1: Persistent extreme negative self-perception: self-loathing or view of self as damaged / defective

4	Believes he is no good at anything	Negative Self-Image
8	Complains of not being likeable	Negative Self-Image
10	Dislikes himself	Negative Self-Image
25	Fears he might do something bad	Negative Self-Image

27	Feels ashamed	Negative Self-Image
28	Feels worthless or inferior	Negative Self-Image
33	Has a low opinion of himself	Negative Self-Image
41	Lacks confidence	Low Confidence
45	Low self-esteem	Composite Self Esteem
57	Says he is "bad", or "no good"	Negative Self-Image
64	Thinks other children are better than him	Negative Self-Image

D2: Attachment insecurity and disorganization (either D2.a. parentified over-protection of caregivers; or D2.b. difficulty tolerating reunion following separation from primary caregivers)

49	Precocious (talks or behaves like an adult)	Pseudomature Interpersonal Behaviour
68	Too independent	Pseudomature Interpersonal Behaviour
70	Treats you as though you were the child, and he was the parent	Pseudomature Interpersonal Behaviour
72	Tries too hard to please you	Insecure Interpersonal Behaviour

D3: Extreme persistent distrust, defiance or lack of reciprocity in close relationships (either D3a. expectation of betrayal; or D3b. oppositional-defiance based on expectation of coercion or exploitation)

3	Avoids eye contact, except if in 'trouble'	Non-reciprocal Interpersonal Behaviour
6	Changes friends quickly	Indiscriminate Interpersonal Behaviour
11	Distrusts adults	Anxious-Distrustful
13	Does not share with friends	Non-reciprocal Interpersonal Behaviour
14	Does not show affection	Non-reciprocal Interpersonal Behaviour
22	Fearful of men in general	Anxious-Distrustful
26	Fears you will reject him	Insecure Interpersonal Behaviour
36	Hides feelings	Insecure Interpersonal Behaviour
39	Is convinced that friends will reject him	Insecure Interpersonal Behaviour
48	Possessive, can't share friends	Non-reciprocal Interpersonal Behaviour
52	Refuses to talk	Insecure Interpersonal Behaviour
54	Resists being comforted when hurt	Non-reciprocal Interpersonal Behaviour
56	Says friends are against him	Insecure Interpersonal Behaviour
58	Secretive	Non-reciprocal Interpersonal Behaviour
61	Steals food	Food Maintenance
62	Suspicious	Non-reciprocal Interpersonal Behaviour
78	Withdrawn	Insecure Interpersonal Behaviour
80	Won't communicate with other children	Non-reciprocal Interpersonal Behaviour
120	Won't say when physically hurt	Abnormal Pain Response

D4: Reactive verbal or physical aggression

69	Too jealous	Pseudomature Interpersonal Behaviour
95	Forces or pressures children into sexual acts	Sexual Behaviour

D5: Psychological boundary deficits (either D5a. inappropriate (excessive or promiscuous) intimate contact (physical or sexual); or D5b. or excessive reliance on peers or adults for safety and reassurance)

7	Clingy	Indiscriminate Interpersonal Behaviour
9	Craves affection	Indiscriminate Interpersonal Behaviour
38	Hugs men, other than relative or male carer	Indiscriminate Interpersonal Behaviour
53	Relates to strangers 'as if they were family'	Indiscriminate Interpersonal Behaviour
59	Seems insecure	Insecure Interpersonal Behaviour
67	Too friendly with strangers	Indiscriminate Interpersonal Behaviour
71	Tries too hard to please other children	Insecure Interpersonal Behaviour
90	Describes or imitates sexual behaviour	Sexual Behaviour
94	'Flirts' with strangers	Sexual Behaviour
101	Kisses with open mouth	Sexual Behaviour
102	Masturbates at home in view of others	Other Items
103	Masturbates at school, or in public	Other Items
108	Sexual behaviour not appropriate for his age	Sexual Behaviour
109	Sexual intercourse with another young person	Sexual Behaviour
110	Sexual relations with an adult	Sexual Behaviour
111	Shows sex parts to children (other than siblings)	Sexual Behaviour
112	Starts rude conversations, tells jokes about sex	Sexual Behaviour
117	Touches or puts mouth on other person's sex parts	Sexual Behaviour
118	Tries to involve others in sexual behaviour	Sexual Behaviour

D6: Impaired interpersonal empathy (either D6.a. lacks empathy for, or intolerant of, others' distress; or D6.b. excessive responsiveness to the distress of others)

42	Lacks guilt or empathy	Non-reciprocal Interpersonal Behaviour
46	Manipulates or 'uses' friends	Non-reciprocal Interpersonal Behaviour
66	Too dramatic (false emotions)	Pseudomature Interpersonal Behaviour
74	Uncaring (shows little concern for others)	Non-reciprocal Interpersonal Behaviour

N/A (Items that do not fit with the DTD criteria)

34	Has an imaginary friend	Other Items
44	Lives in a fantasy world	Insecure Interpersonal Behaviour
50	Prefers to be with adults, rather than children	Pseudomature Interpersonal Behaviour
51	Prefers to mix with older children	Pseudomature Interpersonal Behaviour
63	Thinks he is someone or something else	Other Items
83	Attempts suicide	Suicide Discourse